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JOURNAL

OF

THE BRITISH FIRE PREVENTION COMMITTEE

SPECIAL SUBJECT:

THE RECORD

OF THE

SPECIAL COMMISSION

FORMED BY

THE BRITISH FIRE PREVENTION COMMITTEE

TO VISIT

The Principal Cities of Central Europe

ON THE OCCASION OF THE

International Fire Service Congress at Budapest, 1904

BEING A

DIARY AND NOTES

COMPILED FROM THE MEMORANDA OF

THE MEMBERS OF THE COMMISSION

BY

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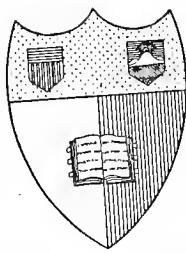
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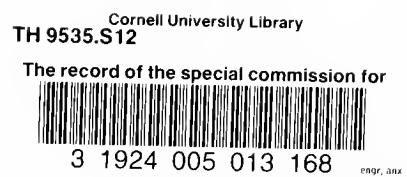


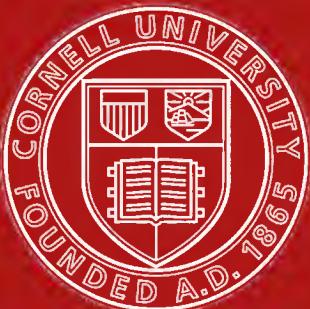
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(SPECIAL SUBJECT.)

BRITISH FIRE PREVENTION COMMITTEE

NO. II.—February, 1905.



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AND

ELLIS MARSLAND

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OBJECTS OF THE COMMITTEE:

The main objects of the Committee are :—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts, and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account to be read as expressions of opinion, criticisms, or comparisons.

The Committee is not responsible for the views of individual authors as expressed in Papers or Notes, but only for such observations as are formally issued on behalf of the Executive.

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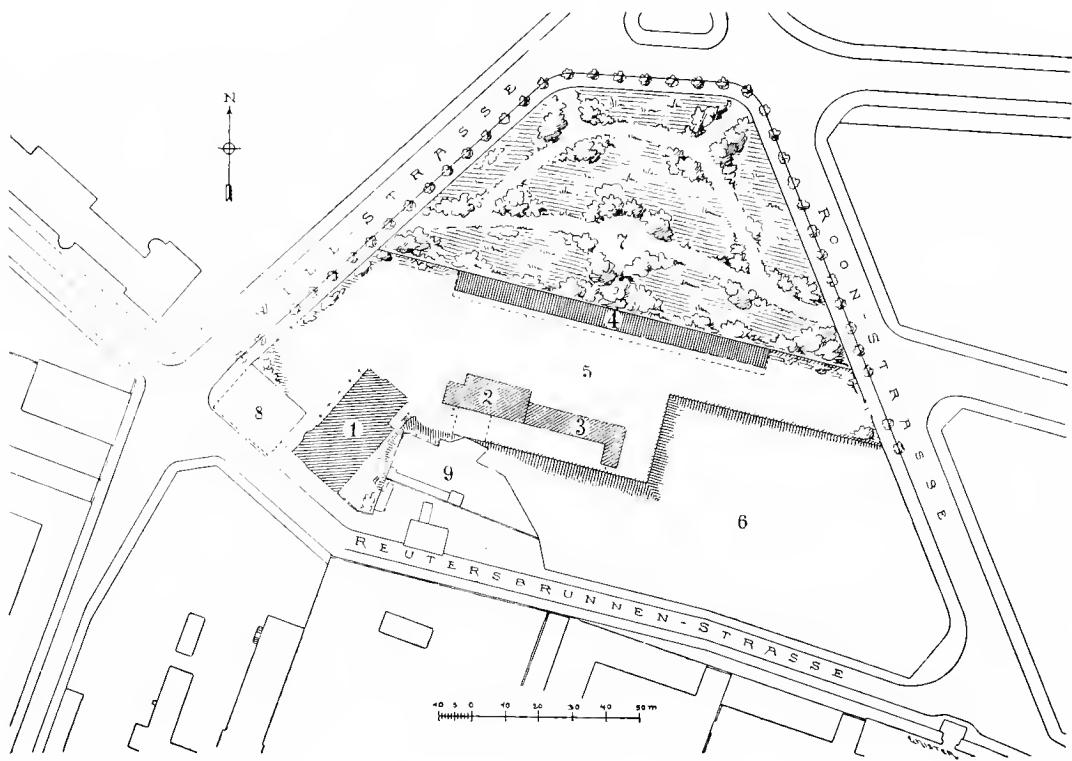
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1. Fire Station. 2. Smithy and Locksmiths' Workshop. 3. Carpenters' Workshops. 4. Sheds. 5. Drill Yard.
6. Municipal Property. 7. Public Gardens. 8. Adjoining Owner. 9. Adjoining Owner.

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G. H. Pizey, Chief Officer, the Chingford Fire Brigade; Member of the Council of the National Fire Brigades' Union.

Ellis H. Pritchett, F.R.I.B.A., F.S.I., Chief Officer of the Swindon Borough Fire Brigade; Member of the Council of the National Fire Brigades' Union.

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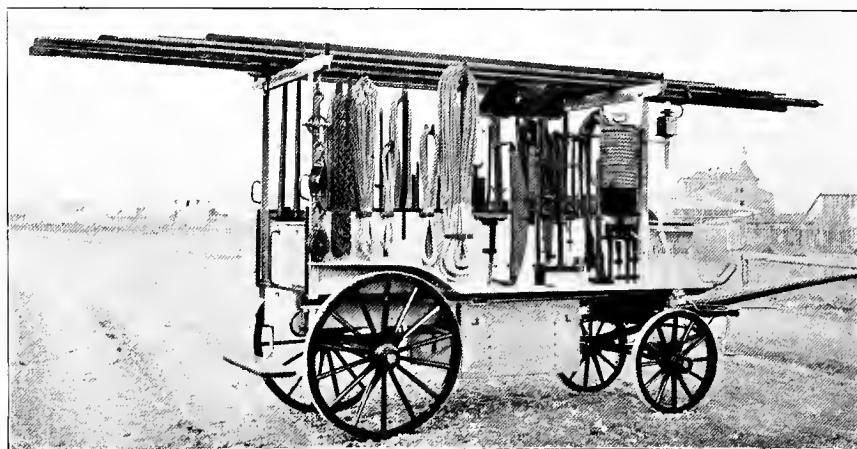
Charles Fox, Lieut.-Colonel, F.R.G.S., Chief Officer of the London Salvage Corps; Vice-President of the National Fire Brigades' Union; Member of the International Fire Service Council.

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ERRATA.

Page 25.—*Rink* Theatre fire of 1871 should read—*Ring* Theatre fire of 1881.



MUNICH PROFESSIONAL FIRE BRIGADE. DANGEROUS STRUCTURE FIRST-AID TRAP.

NOTE.

A CORDIAL invitation from the Hungarian Fire Brigades' Union having been received by the Executive of the British Fire Prevention Committee—as organisers of the London International Fire Prevention Congress of 1903—to attend the International Fire Service Congress at Budapest, it was decided that a Special Commission be formed to attend, and that the opportunity be taken to visit some of the principal cities of Central Europe.

A like invitation having also been received by the members of the Council of the National Fire Brigades' Union, an arrangement was come to by which the British Fire Prevention Committee's Commission should be constituted both from the National Fire Brigades' Union and from the Committee, and that the Commission should represent jointly the Committee and the Union at the Budapest Conference.

The Chairman of the British Fire Prevention Committee, who also holds office as a Vice-President of the National Fire Brigades' Union, was requested to act as Chairman of this Commission, and the General Honorary Secretaries of the two bodies undertook the functions of Honorary Secretaries and Treasurers to the Commission. The Commission further comprised three Executive officers of the British Fire Prevention Committee, and three members of the Council of the National Fire Brigades' Union.

The object of the Commission was, in the first instance, to attend the Congress which had been convened under the auspices of the International Fire Service Council.

The Commission was further to obtain information regarding the Fire Preventive measures and Fire Service Arrangements of the following cities, namely in order of rotation:—Vienna, Budapest, Munich, Nuremberg, Frankfort, and Cologne. These cities were situated in Austria, Hungary, and in Germany. The route made it convenient for the Commission to see something of Hungary, of the Tyrol, and of the Rhine district. Pressburg, Salzburg, and Coblenz were thus among the towns visited.

All the members of the Commission were pressed for time, and thus it became necessary to travel as rapidly as possible, and to see as much as practicable in the least possible number of hours. A distance of over 1,000 miles each way had to be covered partially by travelling at night. To avoid over fatigue, however, three full days' rest was allowed for in Hungary, on the Ballaton Lake; in Austria, at Salzburg; and in Germany, on the Rhine.

The Commission's journey was timed to occupy seventeen days, *i.e.*, four in travel, three in rest, and ten in attending the Congress and in collecting information. Every possible care was taken in arranging the programme of the Commission in detail beforehand with a view of obtaining a precise time-table, and wherever it was deemed necessary, special facilities were requested well in advance, which were obtained, thanks, as a rule, to the great kindness of various British Consular officers, who had been courteously advised of the Commission's visit at the instance of the Foreign Office. By these careful

preliminary preparations the journey throughout was highly instructive, thoroughly enjoyable, and in every way a great success.

Remark should be made of the courtesy and hospitality everywhere encountered. In Hungary the reception of the Commission was an enthusiastic one. It would indeed be difficult to describe how cordially the Commission,—as representing a British service and a British technical society,—was met everywhere in town and hamlet alike. In Austria every possible facility was most willingly accorded the Commission. In Germany the professional courtesies, both official and private, were of a most friendly character, and seeing how much is unfortunately nowadays written as to the German dislike for Britishers, special note should be taken of this pleasant meeting, and the pleasure it certainly afforded to host and visitor alike.

To all those who so kindly assisted the Commission in its search for information, and who showed so much courtesy and hospitality, this opportunity is taken to record the sincerest thanks of the Commission, and further to say how highly each individual member of the Commission appreciated the many kindnesses.

It would be almost impossible to discriminate between the services rendered by individuals. But two names must call for particular mention. The one is that of Count Victor Szechenyi, the Congress Chairman at Budapest, whose unfailing attention to the British visitors on all occasions will long be remembered by them. The other is that of Professor Littmann, of Munich, who besides showing the Commission a most instructive series of works, all the outcome of the Professor's master mind,—in his capacity as an architect and as one who has taken the question of Fire Prevention to heart,—further in his private capacity showed the Commission that kindly personal hospitality which was more particularly appreciated as forming a homelike interlude in a round of more or less formal functions.

It was not the duty of the Commission to report in detail upon its journey, but it was considered desirable by the British Fire Prevention Committee's Executive that some of the information obtained and impressions gained should be recorded for the benefit of others.

Thus it is that this record has been compiled from the rough notes of various members of the Commission, each of whom took notice of some points of particular interest. The notes are not intended to be exhaustive, but are presented in the simple form of annotations, and if these annotations are found to be of some slight use, the Commissioners will be satisfied that their efforts to record the journey have not been in vain.

Members of a Commission returning from a journey of this kind are frequently requested to summarise their impressions regarding good points observed in a few sentences. They are as follows:—

SOME IMPRESSIONS.

1.—FIRE PREVENTION.

1. Architects, Engineers, and Public Officials were found generally to take a greater interest in questions of fire prevention than is the rule at home. They seemed fully impressed with the necessity of systematic Fire Prevention for the public weal.

2. The codes of general building regulations and special fire preventive regulations were everywhere found to be of a very comprehensive character. In Bavaria and in the Rhenish cities visited the control of minute details appeared remarkable.

3. No limit seems to be placed upon the area and cubical extent of individual buildings, but buildings of more than ordinary size are subject to such precautionary measures in matters of detail as the separation of shop windows from the counters and gangways by fire-resisting materials, to prevent an outbreak of fire immediately involving disaster. Another such point of detail was the exact definition of the maximum distance from any point on a floor, to the nearest staircase. Another was the suitable provision of electric fire-call points in large retail stores, and the provision of fixed iron scaling ladders to facilitate the rapid entrance of firemen to the upper storeys of this class of building. Again it was observed that in one of the retail stores all the iron doors in a divisional wall could be operated electrically from one point, and closed simultaneously.

II.—THEATRES.

1. The whole problem of Theatre safety seemed an essentially different one to that to which we are used in Great Britain, for, owing to the theatre being looked upon as the Shrine of Art that must have an isolated site, the question of planning with the view of obtaining rapid exit is simplified.

2. Further, owing to its being considered essential to have large ante-rooms and lounges to congregate in during the intervals of a performance, the whole difficulty of obtaining corridors and ante-rooms of sufficient width around the auditorium in the interests of safety are obviated. Speaking generally, exits and exit staircases were found to be excellent in all the theatres visited.

3. On the stage, the precautions of reducing the amount of inflammable material, by substituting metallic construction for wood construction was generally observed. But the rendering of scenery non-inflammable was only practised in one or two instances, and then only in a very perfunctory manner, without due regard to the necessity of impregnating the thin scantlings of the scenic framework.

4. Great reliance appears to be placed in stage sprinklers, or drenchers, and no Theatre was visited that had not a complete system of stage drenchers. There is no doubt that, if brought into action, these drenchers are highly efficient, but it is essential that they should be controllable from two points at least—one on the stage, and one at a distance from the stage. The impression obtained from the actual working of the drenchers at Budapest was thoroughly convincing as to their efficiency, if promptly operated.

5. Everywhere the substantial fire-resisting curtain of metal framing and metal surface was found, the latter frequently supplemented by a protective covering, or a filling of a non-conductive character. The division of the auditorium from the stage by strong fire-resisting curtains was supplemented by similar divisions between the main stage and the so-called rear stage which generally served as an extensive scene dock.

6. Precautions were taken for limiting the use of open lights by applying electrical heaters in the dressing rooms for making up, etc.; and considerable attention appeared to be given to such matters of detail.

7. The general neatness of the stage, and the cleanliness of the stage offices, as also the general military precision of the working of the stage staff, called for remark.

8. A large number of Electric Fire-call points (frequently also automatic thermostat fire alarms) were provided.

9. Strong theatre fire-watches were also provided by the brigades. In some cities there were permanent watches apart from the watches provided during the performance.

III.—NATIONAL FIRE SERVICE.

(*Volunteer, etc., Fire Brigades.*)

1. The general National Fire Services in Austria, Hungary, and Bavaria, appeared to be of a very high standard, far in advance of what we are at present used to. The large number of brigades available in the country, the few districts without brigades, the excellent equipment and efficiency of the minor volunteer and factory brigades called for comment.

2. In the countries visited, the country brigades were practically all volunteers, only a few of the Hungarian brigades met with being "obligatory" ones. The Volunteer Fire Service seemed very popular, and appears to be well supported. It appears to receive all necessary recognition from the public authorities, and all the official and royal patronage that assists so much in voluntary enterprise. Good service, both on the part of the officers and men is recognised by suitable distinctions. There is a marked desire for sound technical training on the part of the officers of the volunteer fire brigades, and the general average knowledge of fire service matters among these volunteer officers was very high. This appeared to be mainly due to the systematic inspection of the brigades by the officials of the fire brigade associations, and to the officers' courses and schools of instruction.

3. The Country Fire Brigades, however, all appeared to be abundantly staffed for the work they have to do. The great strength of the country brigades is due to their considering it essential to rely upon their own strength for pumping where manual engines are used, and generally owing to the very few steam fire engines used in the country districts. There was also apparently the feeling that it was better to have the brigade over-manned than to run the risk of being under-manned in case of emergency. The large personnel of the brigades makes them independent of promiscuous help, and even of police assistance at fires.

4. In equipment, these Country Brigades appear to be well served by their manufacturers although the gear was frequently somewhat light. They generally had well-built horsed manuals, with hose reel attached and excellent long ladders. The brigades all had pompier ladder teams.

5. It was noticeable that in most Volunteer Brigades some four to six men always slept (by rotation) at their station of a night and did duty for the day on Sundays, when most of the men were not expected to be within as easy reach as on week-days.

IV.—PROFESSIONAL FIRE SERVICE.

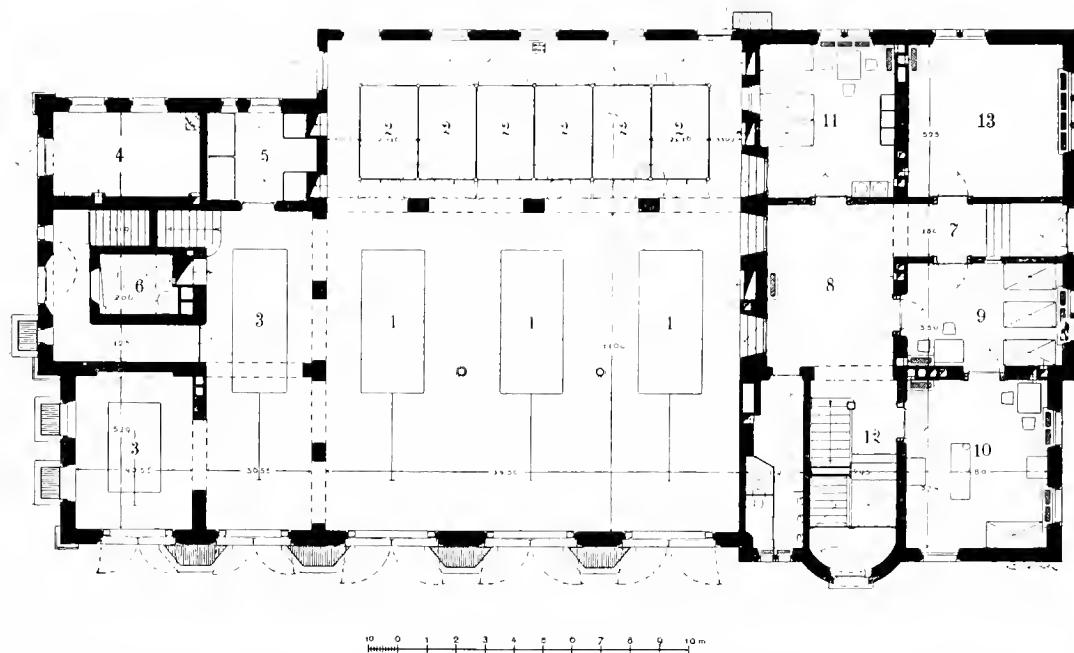
(*The Professional or Retained Fire Brigades of Vienna, Munich, Nuremberg, Frankfort, and Cologne.*)

1. The Professional Brigades of Vienna, Munich, Frankfort, and Cologne, and the Retained Brigade at Nuremberg all showed a very high state of efficiency in management, staffing, modern equipment, and the technical knowledge of their officers.

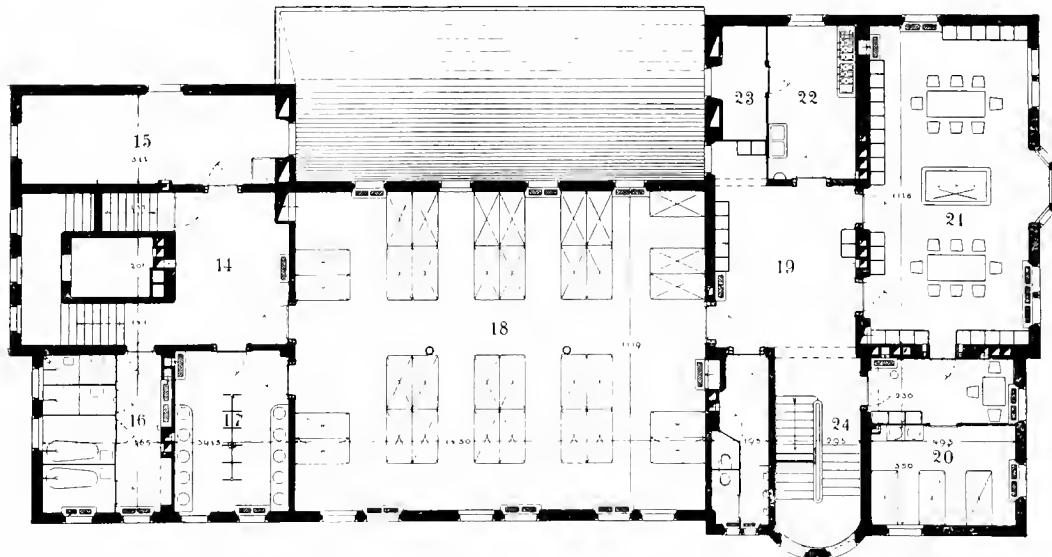
2. The position of officer in a Professional Fire Brigade in all these towns was certainly a post that could only be filled by a man of education and of technical attainments.



FIG. 1.—NUREMBERG RETAINED FIRE BRIGADE. DISTRICT FIRE STATION.



1. Engine House. 2. Stables. 3. Reserve Steamer. 4. Loose Box. 5. Fodder. 6. Hose Tower and Staircase. 7. Main Entrance. 8. Lobby. 9. Duty Men. 10. Watch Room and Telegraph Instruments. 11. Coachmen. 12. Main Staircase. 13. Office.



14. Lobby. 15. Spare Kit Room. 16. Bath Rooms. 17. Lavatory. 18. Dormitory. 19. Lobby. 20. Foremen's Room. 21. Day Room. 22. Kitchen. 23. Larder. 24. Main Staircase.

Figs. 2 and 3.—NUREMBERG RETAINED FIRE BRIGADE. DISTRICT FIRE STATION—GROUND AND FIRST FLOOR PLANS.

3. The horses of the Munich Brigade were certainly the most remarkable for stamina seen on the journey. Next to them came Vienna.

4. The new Fire Stations at Munich, Nuremberg, Frankfort, and Cologne all called for special comment as to the excellence of planning, the extensive accommodation for the firemen, and general facilities. The Headquarters at Munich was far and away the finest Headquarters' station visited, and the district station at Cologne the finest district station.

5. The very general recognition of the advantages obtainable by thoroughly up-to-date appliances seemed to have been everywhere appreciated by the various Municipalities. There was no brigade without several 80 feet mechanical or pneumatic long ladders of the most modern type. Large chemical engines for the first "turn-out" were found everywhere. Hook ladder work was general. Smoke helmet work was taken as a matter of course in all brigades. Smoke helmets seem to have been carried on most engines, and at least with each unit. Modern minor gear was very noticeable, such as electric lamps, magnesium torches, searchlights, oxygen apparatus.

6. The problem under investigation everywhere was that of motor traction. For appliances other than steam fire engines, the Vienna electrical traps (worked on the front wheels), seemed most serviceable.

7. The appliances of the professional brigades were well designed and of excellent finish. In mechanical long ladders, the South German types were of remarkable efficiency.

8. In the professional brigades the general fitness of the men was commented upon, and it was ascertained that practically every man did at least two hours' drill or gymnasium work per diem, unless he had been attending and actually working at a fire. The men were extraordinarily well looked after, but their requirements as far as food and cooking facilities were concerned were comparatively simple.

9. The most remarkable feature of anything appertaining to the professional Fire Service in cities was the recognition of the necessity of having auxiliaries to meet great emergencies. The possibility of the conflagration hazard and of great catastrophes such as theatre fires, was fully recognised. The auxiliaries were generally obtained with the aid of Suburban Volunteer Brigades working on the fringe of the municipal area, who were called in to assist when required. In one city there was an auxiliary of retained men apart from the professional Brigade, and in another there was a very efficient system of Factory Brigades, organised to render assistance outside their own factories.

10. Generally speaking, nearly every city was thoroughly prepared for emergencies, as far as auxiliaries were concerned, and at the same time they were able to keep their professional Brigade within reasonable economical bounds of expenditure by knowing that they had trained auxiliaries. As to the auxiliaries themselves, they were generally of very high efficiency. The whole principle is practically that of our Army and the Auxiliary forces, and was certainly found to work exceedingly well in the cities visited. In all cases, however, the legal position of these auxiliaries was distinctly defined. They were also, as a rule, entirely dependent upon the respective municipalities for their gear and stations.

11. The Commission considered that this aspect of professional Brigades augmented by well-organised auxiliaries seemed to embody the best method of obtaining an efficient economic fire service organisation for large centres, and that this question required further study as it would probably be found to lend itself to adoption in this country.

12. The very economical yet highly efficient fire service arrangements at Nuremberg called for special remark. This city has a retained brigade of municipal employees under two professional officers, with auxiliaries in form of strong volunteer brigades. The system

was the cheapest met with for a city of the size of Nuremberg, and it seems to have worked exceedingly well for many years.

13. The Commission noticed that in Vienna the Suburban volunteer force have a permanent staff, comprising a drill sergeant and a telegraph clerk, detached from the professional fire brigade headquarters, always on duty at most of the Volunteer Stations.

14. The necessity of extensive electric fire-call services appears to be generally recognised, and are being extended in important centres. In many instances the fire-call points are connected both with the district and headquarters stations by independent circuits; Morse recording instruments are generally used. In some cities, householders are supplied with cards, which they are expected to fit near the entrances to their houses, giving information as to the position of Fire-call points and other information with regard to Municipal matters.

15. In the Annual Reports and printed matter, drill books, and the like, there seemed to be much that might be adapted to our purposes.

16. The general use of firemen in the workshops and general odd jobs of the Fire Stations was commented upon. They were always kept busy when on duty, but had full freedom when off duty.

V.—FIRE SURVEY WORK.

1. The senior local Fire Brigade Officers, both professional or volunteer, were everywhere consulted by the local authorities on all matters of fire prevention in buildings, passing of plans, and the like.

2. At Munich the Fire Brigade and Building Control work was in the hands of one department and under one chief official, it being rightly considered that the correct economic management of the Fire question was to have both the Fire Preventive and Fire Brigade service in one hand, the Fire Brigade service being supplementary to the Fire Preventive service. This was, however, the exception, although there was some slight similarity in Vienna, where the Municipal Brigade practically ranks as portion of the Surveyor's Department.

3. Generally speaking, Fire Brigade Officers were very considerably utilised for Fire Survey in conjunction with the Building Control Departments, and are frequently called upon to make inspections, etc.

VI.—AMBULANCE.

1. The necessity of Ambulance work for Fire Brigades in large cities was apparently not recognised to the extent we are used to, but this is mainly due to the splendid Civil Ambulance Services found in most centres. Particular attention is called to the splendid equipment of the Vienna and Budapest Ambulance Societies, and all interested in ambulance work should not fail to visit both Vienna and Budapest. This subject was somewhat outside the scope of the Commission, but nevertheless the Civil Ambulance Service was probably one of the matters that most impressed the members on their journey.

SUMMARY.

From among the various impressions recorded above, the following points might be said to be those which most impressed themselves on the mind of the members of the Commission as being particularly commendable :—

- a.* The great attention paid to questions of technical detail in building legislation and control.
- b.* The co-operation of the Building Control Departments and Fire Brigades in the Fire Survey systems.
- c.* The general exits, stage drenchers, the substantial fire-resisting curtains, the numerous fire-call points, and the efficient fire-watches in theatres.
- d.* The high general state of efficiency in the country Fire Brigades, and usefulness of the National Fire Brigade Associations.
- e.* The general high efficiency and splendid equipment of the professional Fire Brigades.
- f.* The excellence of the mechanical long ladders.
- g.* The great attention paid to auxiliaries by the Professional Fire Service.
- h.* The economic organisation of a retained brigade of municipal employees under professional officers.
- i.* The provision of ample water supply under high pressure, and the general introduction of standard hydrant posts.
- k.* The high efficiency of the Volunteer Ambulance Societies, and the excellence of their organisation and equipment.

Attention should be called in this note to an Appendix to the Record dealing with the great Petroleum fire at Antwerp, the scene of which was visited by two members of the Commission on the return journey.

A further Appendix deals with the General Arrangements of the Commission which may be useful for reference purposes should similar Commissions be organised at a future date.

Further, it may be of interest to state that copies of this record will be put at the disposal of the various Government Departments and leading Municipal Authorities, who have to deal with questions relating to fire protection. The report will also be sent to the leading professional fire brigade officers, and to one hundred chief officers of volunteer fire brigades affiliated to the National Fire Brigades' Union.

In conclusion, reference should be made to the fact that this record has the benefit of various illustrations generously provided by various public authorities and individuals, to whom the thanks of the Executive are due.

EDWIN O. SACHS.

HORACE S. FOLKER. ELLIS MARSLAND.

4, WATERLOO PLACE, LONDON, S.W.

December, 1904.

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THE RECORD.

Saturday, August 13th. Journey Outwards.

Diary of the Journey.

Saturday, Aug. 13th.

Journey Outwards.

The Commission assembled under the clock at **Charing Cross Station, London**, at 9.20 a.m., and registered luggage to Vienna.

The Commission left Charing Cross by the 10 a.m. boat train for **Dover**, in special saloon, arriving 12 (noon) at Dover, where they went on board the steamer for Ostend, on which a special state-room was reserved. Very smooth passage. Luncheon on board.

At 4.15 p.m. **Ostend** was reached. Tea at the station.

The Commission boarded the train at 4.46 p.m. for Vienna (*train de luxe*), *via* Brussels, Liège, Herbesthal, Cologne, Frankfort, Würzburg, Nuremberg, Passau, Wels, St. Poelten, Vienna. Dinner on board the train. A suite of special sleeping-car compartments had been reserved.

Some Technical Notes.

The following started together: *Messrs. Max Clarke, H. S. Folker, H. F. J. Hallows, Ellis Marsland, G. H. Pizey, Ellis H. Pritchett, Edwin O. Sachs, F. Sheppard*, accompanied by *Lieut.-Col. Fox*.

Several of the *S. E. and C. Railway Company's* officials were kindly in attendance at Charing Cross. Representatives of the Company were kindly in attendance at Dover and Ostend.

Mr. Walmisley, M.Inst.C.E., Engineer to the Dover Harbour Board, Member of the B.F.P.C.'s Parliamentary Sub-Committee, saw the party off at Dover pier.

The *Wireless Telegraphy* installation on board the Ostend boat was of considerable interest, and some of the party sent messages to their home addresses by means of this service.

The management of the *Wagon Lits Co.*'s cars was excellent, both on this and other services utilised by the party, with the exception that the lavatories were neither kept properly cleansed nor ventilated *en route*.

Mr. Percy Collins joined the party about midnight.

The *Customs Officers*, both on the frontiers crossed on the outward as well as on the homeward journey, passed all baggage bearing the Commission's labels generally without examination, or at most, with the *pro forma* examination of one piece. The Customs authorities had been advised of the Commission's journey, and a special representative was generally kindly in attendance.

The *Railway Companies or State Railway Administrations*, over whose lines the Commission travelled on the Continent, accorded every possible facility throughout the journey, reserving Saloons or suitable suites of corridor carriage compartments, and where necessary kindly having special officials in attendance. The railway authorities throughout had been officially advised of the Commission's journey.

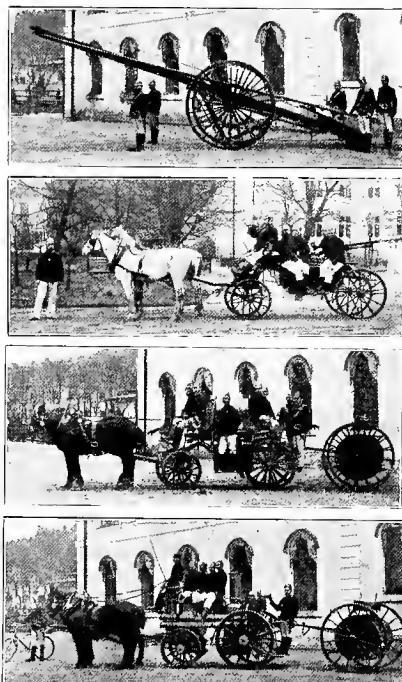
The excellent arrangement and satisfactory architectural treatment of the *Railway Stations in Germany* called for considerable comment, the stations at Cologne, Frankfort, and Nuremberg being particularly well designed and practical.

Diary.

Sunday, Aug. 14th.

JOURNEY OUTWARDS; VIENNA.

Breakfast on the train. Customs examination at Frontier on board the train. Luncheon on train. An Officer of the Austrian Imperial Fire Brigades' Union met the Commission at *Wels* to bid it welcome to Austria.



Figs. 47.—AUSTRIAN RURAL VOLUNTEER FIRE SERVICE. TYPICAL FIRE APPLIANCES.

The Commission **arrived at Vienna**, 5.25 p.m., and drove to the *Grand Hotel*, where quarters were reserved. Dinner at the Hotel. The party then drove around the boulevards to the **Prater Park** in an Electric Motor "Trap" provided by the Vienna Fire Brigade, visited the "Englischer Garten," and returned to the Hotel.

Technical Notes.

During the latter part of the journey two sets of horsed manual fire engines were seen from the train speeding to fire which afterwards was ascertained to be a *Forest Fire*. Just upon arrival at Vienna, a suburban fire brigade manual turn-out, with a large complement of men, was moving off by train to this fire.

Austria (as distinct from Hungary) had a population of over 26 millions at the last census, taken in 1900. The area covered is over 300,000 square kilometres, approximately the same area as that of the United Kingdom, and it is divided into 17 provinces.

The greater part of the *Volunteer Fire Brigades of Austria* are formed into Provincial Associations. The private factory, mine, and similar brigades are included in these Associations. The organisation by associations dates from the year 1869. The general representation of the Austrian fire service followed in 1885 by an *Austrian Fire Brigade Board*, comprising delegates from the provincial associations, under a president and two vice-presidents. In 1900 this Board was changed to the "*Austrian Imperial Fire Brigades' Association*," which receives a subvention from the Austrian Government. The Association comprised in 1901, 9,100 brigades, and has since increased. It represents practically the entire Austrian service, as only 3 per cent. of the existing brigades are outside the Association. The brigades had in 1901, 196 steam fire engines and 12,779 manual fire engines.

Both the *Imperial Association* and the provincial associations have appointed *Technical Commissions*, which examine all questions of a technical nature in the most thorough manner. In numerous provincial associations, further *Technical Courses* of study for the theoretical and practical teaching of the fire brigade officers and non-commissioned officers have been instituted. Particular attention is directed to the *Inspection Service of the Volunteer Fire Brigades*, and efforts are made to secure uniformity in their organisation. In several provinces, fire brigade inspectors exist, having generally been appointed by the provincial government on the suggestion of the provincial associations.

According to the principles adopted by the *Imperial Association*, every *Austrian Volunteer Fire Brigade* must have two sections, each properly equipped for fire-extinguishing and life-saving work. Each brigade must also have an ambulance section. Every volunteer Fire Brigade that belongs to the Association binds itself to "turn out" not only to fires, but, if requested, to all accidents, in order to render help and save life, so that the ambulance work is specially needed.

A matter of the utmost importance in the economics of the *Austrian Volunteer Fire Service* is the fact that the law of the country requires all *Insurance Corporations and Companies* trading on Austrian territory (whether their head office be in Austria or abroad) to contribute about 2 per cent. of their total gross premium income on the risks taken in Austrian territory, for the specific purpose of assisting in the upkeep of the fire brigades, and towards the firemen's, widows' and orphans' fund.

National Fire Service

Volunteer Fire Brigades

Fire Brigades' Association

Fire Brigade Technical Courses
Volunteer Fire Brigade Inspection

Volunteer Fire Brigade Organisation

Taxation of Insurance Corporations

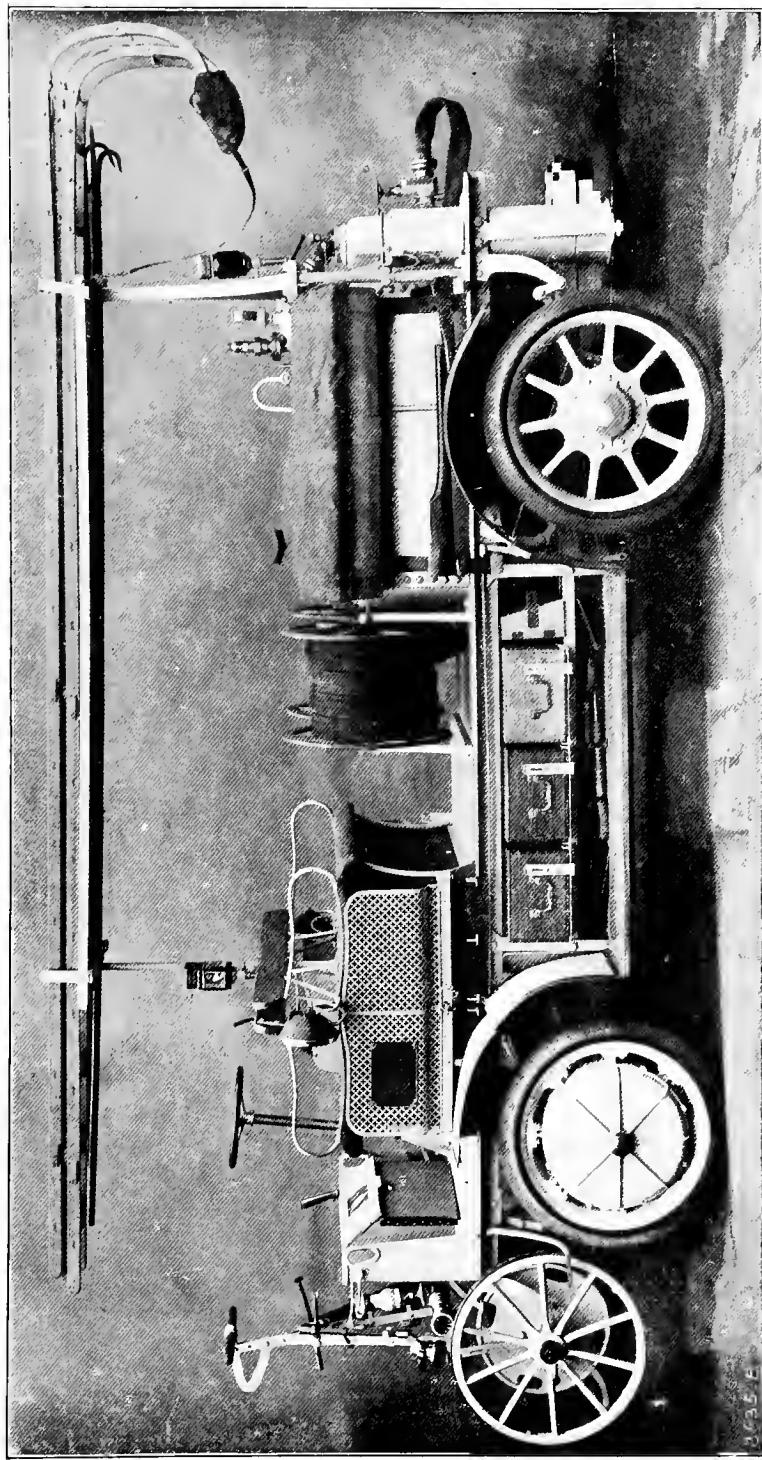


Fig. 8.—VIENNA PROFESSIONAL FIRE BRIGADE. ELECTRICALLY PROPELLED CHEMICAL FIRE ENGINE AND HOOK LADDER TRAP.
By courtesy of "Engineering."

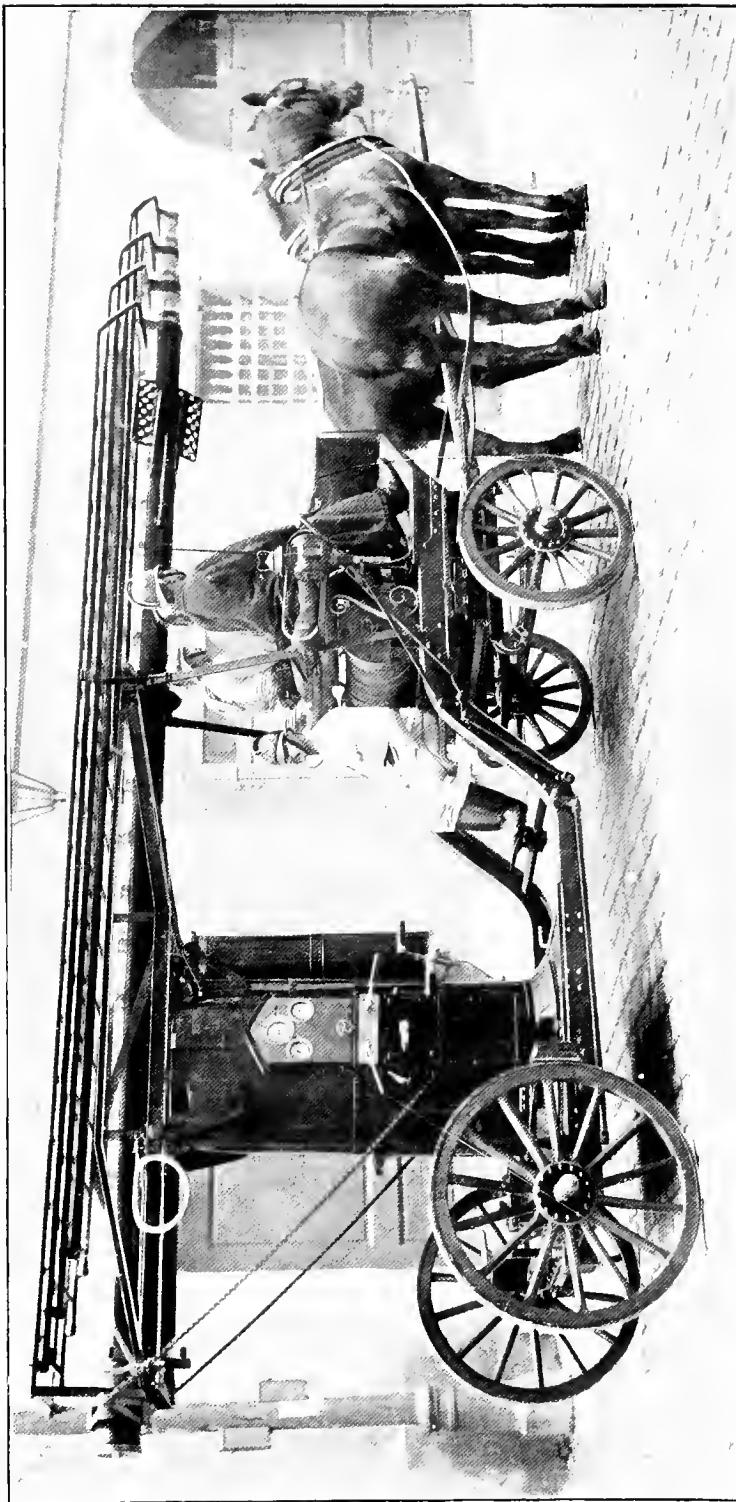


Fig. 9.—VIENNA PROFESSIONAL FIRE BRIGADE. PNEUMATIC SO. F.R. LONG LADDER.
By courtesy of "Engineering."

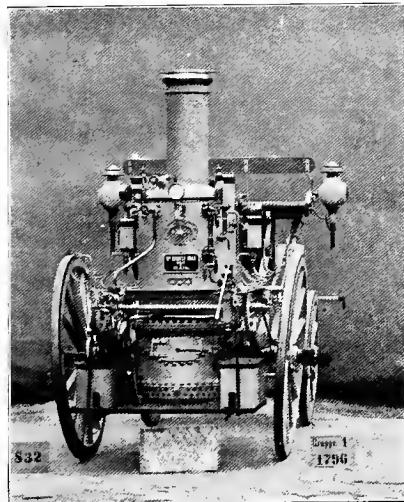
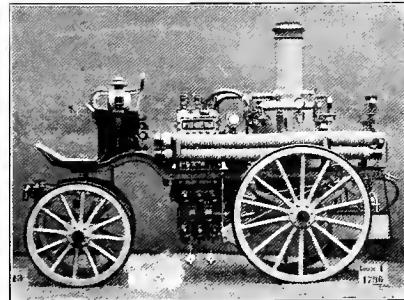
Diary.

Monday, Aug. 15th.

VIENNA.

Breakfast at 8 a.m.

At 9 a.m. the Commission visited the Headquarters of the **Vienna Fire Brigade** at "Am Hof," and inspected the Fire Station and Fire Appliances. There was a display with various appliances followed by a "turn-out." The Fire Brigade Museum was visited. The Commission was thereupon driven in a horsed "Trap" to see a Branch Station.



Figs. 10 and 11.—VIENNA PROFESSIONAL FIRE BRIGADE. TYPICAL STEAM FIRE ENGINE.

Technical Notes.

The Chief Officer of Vienna F.B.: Müller.

In 1892 the Vienna Fire Service was reconstituted on modern lines owing to the area of the Vienna Municipality having been greatly extended. The *Professional Brigade* was somewhat strengthened and entirely re-equipped, and the various existing volunteer brigades of the outlying districts were transformed into suburban volunteer fire brigades, equipped and controlled by the municipality, and standing under the general command of the fire brigade headquarters. The principle involved was the utilisation of the splendid volunteer force around Vienna for the purpose of strengthening the municipal brigade, a principle of great economic advantage, as the professional brigade would otherwise have had to be materially strengthened, *i.e.*, probably trebled. These *Suburban Volunteer Fire Brigades* number no less than 34, and have 1,200 firemen of all ranks. They are practically independent institutions as far as the election of officers and administration is concerned, but their equipment and uniforms are provided by the municipality, their fire stations are thus provided, and in certain districts a staff of professional firemen detached from headquarters are attached to their stations as telegraph clerks and drill-instructors.

The *Suburban Volunteer Brigades* turn out to fires in their own districts, and, further, assist in other districts when so ordered by Headquarters. They form a strong reserve for great fires in the city proper. Headquarters, of course, renders assistance at large suburban fires.

These *Suburban Volunteer Fire Brigades* are very perfectly equipped with appliances, generally of the identical type as those used in the central professional brigade. Some of these suburban brigades are equipped with combined chemical engines with 15 metre long-ladders attached. They have smoke-helmets, and everything that may be termed modern. The men are volunteers in the truest sense of the word—*i.e.*, do not take pay of any description, or make any charges for attendance at fires or refreshments at fires.

In respect to the Vienna "Professional Brigade," as it is generally known, it at present—*i.e.*, in 1904—has a personnel which consists of 8 officers, 5 officials, and 475 men. Of stations there is the headquarters, a district station, four branch stations with steam fire engines, nine small branch stations, and two "watches" in public buildings.

The following are some notes as to the "Professional Brigade":—

The officers of the brigade consist of the commandant, chief inspector, and six inspectors. The officers, of whom four are on duty daily, are all quartered at headquarters. There are three telegraph superintendents. The rank and file is now composed of 8 drill-sergeants, 40 telegraph clerks (three classes), 53 foremen (two classes), 22 engineers and stokers, 248 men (three classes). Twenty-four telegraph clerks and engineers are detailed for duty with the suburban volunteer brigades. There are seventy-eight coachmen.

The following are the fire-extinguishing and life-saving apparatus and service vehicles of all kinds standing ready to "turn out": Two open and two officers' service carriages (at headquarters);—six "traps" for the first "turn-out" (five at headquarters and one at the

Combined Professional and Volunteer Fire Service

Suburban Volunteer Fire Brigades

Suburban Volunteer Fire Brigade Equipment

Professional Fire Brigade

Professional Fire Brigade Staff

Diary.

Monday, Aug. 15th.

VIENNA.

(Visit to the Headquarters of the **Vienna Fire Brigade**, continued.)

Technical Notes.

district fire station), each manned by one officer in charge and nine men, and equipped with three hook-ladders, a portable extension ladder and jumping sheet, a life-saving chute, an ambulance chest, three tool-boxes, a jack, tools, torches, two smoke-helmets, with hand-pump and a hose-reel attached;—five special gear carts (four at headquarters and one at the district fire station), each manned by seven firemen, and equipped like the “traps,” with the exception that, instead of the life-saving chute, the carts carry with them a sliding-sheet, two petroleum torches each, an extension ladder (15 metres long), and some spare coal for the steam fire-engines;—four pneumatic extension ladders 25 metres long, and three extension turn-table ladders each 25 metres long (at headquarters and at two of the substations); each of the pneumatic ladders has three men, and each turn-table ladder five men;—eighteen chemical engines (three at headquarters and one each in the other stations), each having five men, with three hook-ladders, a jointed ladder (in four sections), a hose reel, a hand engine, a smoke helmet, a jumping sheet, an ambulance chest, a tool box, torches, etc.;—eight steam fire engines (three at headquarters and one each in the district fire station and the four steam engine stations), each with an engineer and stoker.

The reserve of appliances includes 12 manual engines, 15 large chemical engines, 17 steel water carts (with 1,000 litre reservoirs). The total number of oxygen smoke helmets in the brigade is 68, and there are 15 ordinary smoke helmets with hand pumps. The total number of horses is 132. One electrically-driven trap and two electrically-driven chemical engines are being tried.

The fire telegraphic and telephonic installation, including the lines in the volunteer brigades district kept up by the professional brigade, comprises 47 telegraph stations, 240 telephone stations, with altogether 161 Morse instruments and 536 semi-public fire call-points.

Professional Fire Brigade Equipment

Electric Motor Chemical Engine and Trap

The *Vienna Fire Brigade Headquarters* comprises a block of archaeological interest, but quite unsuited to its purpose.

The *Appliances of the Vienna Brigade* were of the first order in design and finish. Pneumatic and mechanically-worked 80-feet long ladders of a most efficient type were demonstrated. The horsed chemical engines were very compact. The horsed traps, which were built very low, travelled excellently, and were well fitted out with hook-ladders and much useful small gear. Smoke helmets and similar appliances were most numerous. “Dangerous structure” first-aid gear, in form of crabs, etc., picks, crowbars, etc., were carried on the special gear carts. The reserve of appliances was in perfect order. Net-jumping sheets, round in shape, are used, and held shoulder high, the men facing outwards and not inwards. Chutes of various types are used where large numbers have to be dealt with.

The appliances were perfectly kept. They were demonstrated smartly without noise. The first “turn-out” at headquarters comprised four appliances (“trap,” chemical engine, large trap, 80 feet long ladder), and is kept ready horsed, the horses standing in turns for about twelve hours at a stretch. They apparently feel no ill-effects from this, were in perfect condition, and travelled well, but this idea seemed unnecessary from the English point of view.

“Turn-Out”

Horses

The men wore a white canvas kit. This did not appear appropriate, and was frequently soiled. They wore belts with loose pear-shaped hooks for ladder work. Some of the men were somewhat overloaded with gear (rope, etc.).

The general impression was that of a high state of efficiency and smartness except in respect to the out-of-date fire stations.

The *Vienna Fire Museum* was very instructively arranged. There were numerous diagrams and plans on the walls, which perfectly explained the development of the service. There was a fine

Fire Brigade Museum

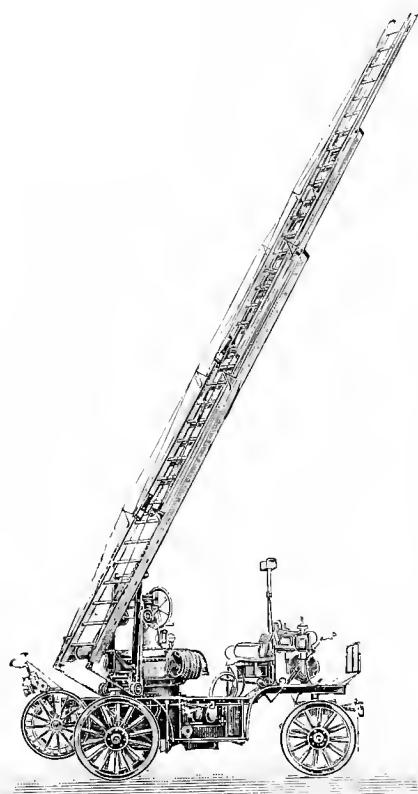


Fig. 12.—VIENNA FIRE SERVICE COMBINED CHEMICAL ENGINE AND EXTENSION LADDER USED IN THE SUBURBAN VOLUNTEER BRIGADES.

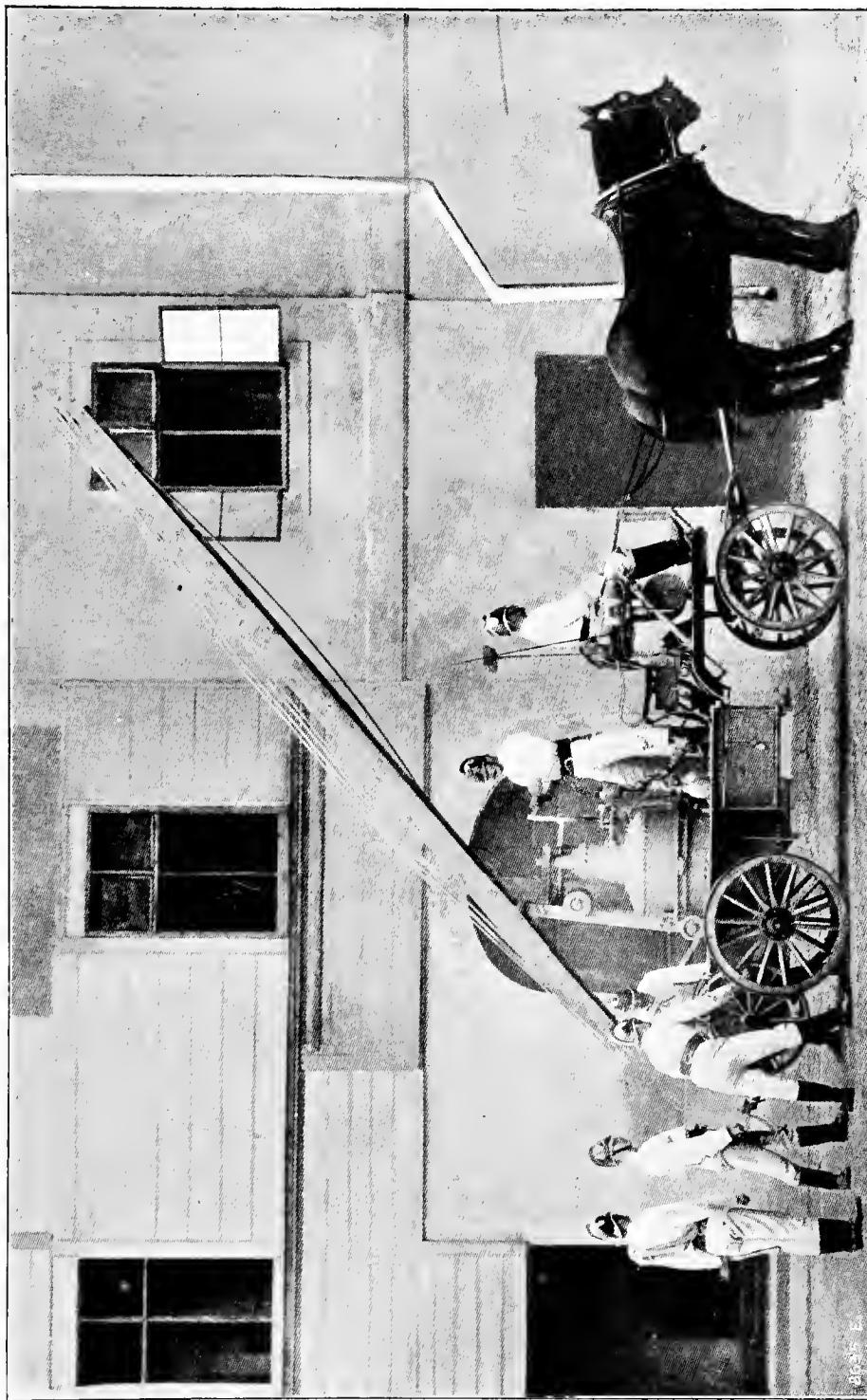


Fig. 13.—VIENNA FIRE SERVICE. COMBINED CHEMICAL ENGINE AND EXTENSION LADDER, USED IN THE SUBURBAN VOLUNTEER FIRE BRIGADES.
By courtesy of "Engineering."

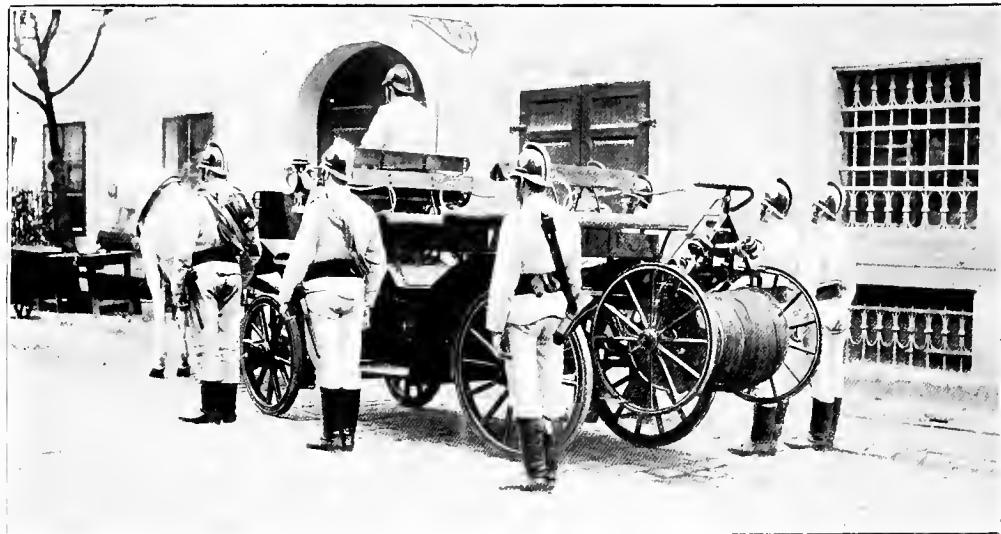


Fig. 14.—VIENNA FIRE SERVICE. TYPICAL TRAP AND HOSE REEL.



By courtesy of "Engineering"

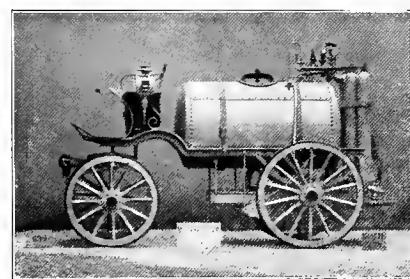
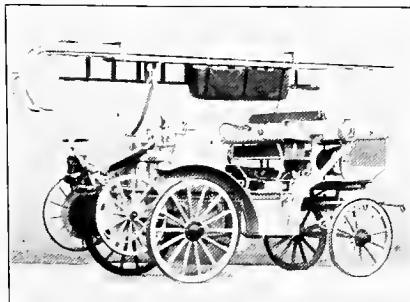
Fig. 15.—VIENNA FIRE SERVICE. TYPICAL HOOK LADDER, TRAP, AND HOSE REEL.

Diary.

Monday, Aug. 15th.

VIENNA.

(Visit to the Headquarters of the **Vienna Fire Brigade**, *continued.*)



Figs. 16 and 17.—VIENNA FIRE SERVICE.
TYPICAL LIGHT AND HEAVY CHEMICAL
ENGINES.

The Commission was driven afterwards to the **Vienna Volunteer Ambulance Society's** Central Station, which was inspected under guidance of the Society's Secretary.

Technical Notes.

collection of pictures—mostly modern—dealing with Fire Brigade life, and presented to the Brigade by local artists.

The *Vienna Fire Brigade's Publications* were very elaborate, exceedingly well printed and illustrated.

The Brigade's system of lock-up *Fire Call-Points*, for which keys are distributed among the police and respectable citizens, does not accord with modern requirements.

The telegraph and telephone installation of the brigade was fair. The *Call-Points* are connected up to the nearest station. All *Call-Points* can be used as telephones.

A *Watch for Lights* showing is still kept on a church tower connected by telephone with Headquarters.

The Brigade provides *Theatre Watches* of an evening, except in the Imperial Theatres which have private brigades.

The *Pompier Ladder Drill*, with ladders of the round hook type, up to the third floor on actual buildings (as distinct from ordinary wood drill-houses) was exceedingly smart and good, and the exhibition of saving life in large numbers with the aid of sliding sheets 30 metres long, 3 metres wide, held at bottom by 6 men, was very rapid. The persons rescued came down feet first.

There is no great need for ambulance instruction in this brigade as the Ambulance Society's "turn-out" attends at fires.

Three *Municipal Chimney-Sweeps* are stationed at Headquarters to attend chimney fires.

An *electrically-driven Motor Chemical Engine*, which was under trial, appeared to be a very satisfactory appliance.

The *Steam Fire Engines* were above the average of Continental steam fire engines seen. They were of Vienna make, and not as heavy as most Continental machines of this kind.

The Chief Officer distinctly stated that he was very satisfied with the *Pneumatic 80-feet Long Ladders*, of which he had three in use.

The *Vienna F.B. Branch-Station* was below the Continental standard for such stations.

The *Vienna Ambulance Society's Station* was the most perfect of its kind. It was excellently situated, well planned and built, and most elaborately equipped. At the time of the visit two horsed ambulance traps were out on "jobs," the third trap with one doctor, two men, and all necessary gear, was turned out in 45 seconds.

The *Reserve of Appliances* was in perfect order.

The statistics, records, etc., were remarkably well kept.

The traps are fairly horsed, and travel rapidly.

A list of beds vacant at hospitals is kept so that patients can be taken to hospital with the certainty of finding a bed.

The Society appears also to attend to infectious cases with special traps, but these are horsed and manned from this station. This is wrong. The service for infectious cases should be entirely isolated.

The *Vienna Volunteer Ambulance Society* was formed on the day after the Rink Theatre Fire of 1871, by Baron Mundi. Its object was in the first instance to create a *Civil Ambulance Service*, and besides this to organise a general auxiliary service on the occasion of great emergencies, such as conflagrations, railway accidents, floods, and the like.

The Society has three departments, the first comprising its *Fire Service*, the second its *Flood Service*, and the third its *First-Aid Service*.

Theatre
Watches

Pompier
Ladders

Chimney-
Sweeps

Pneumatic
Long
Ladders

Ambu-
lance
Society

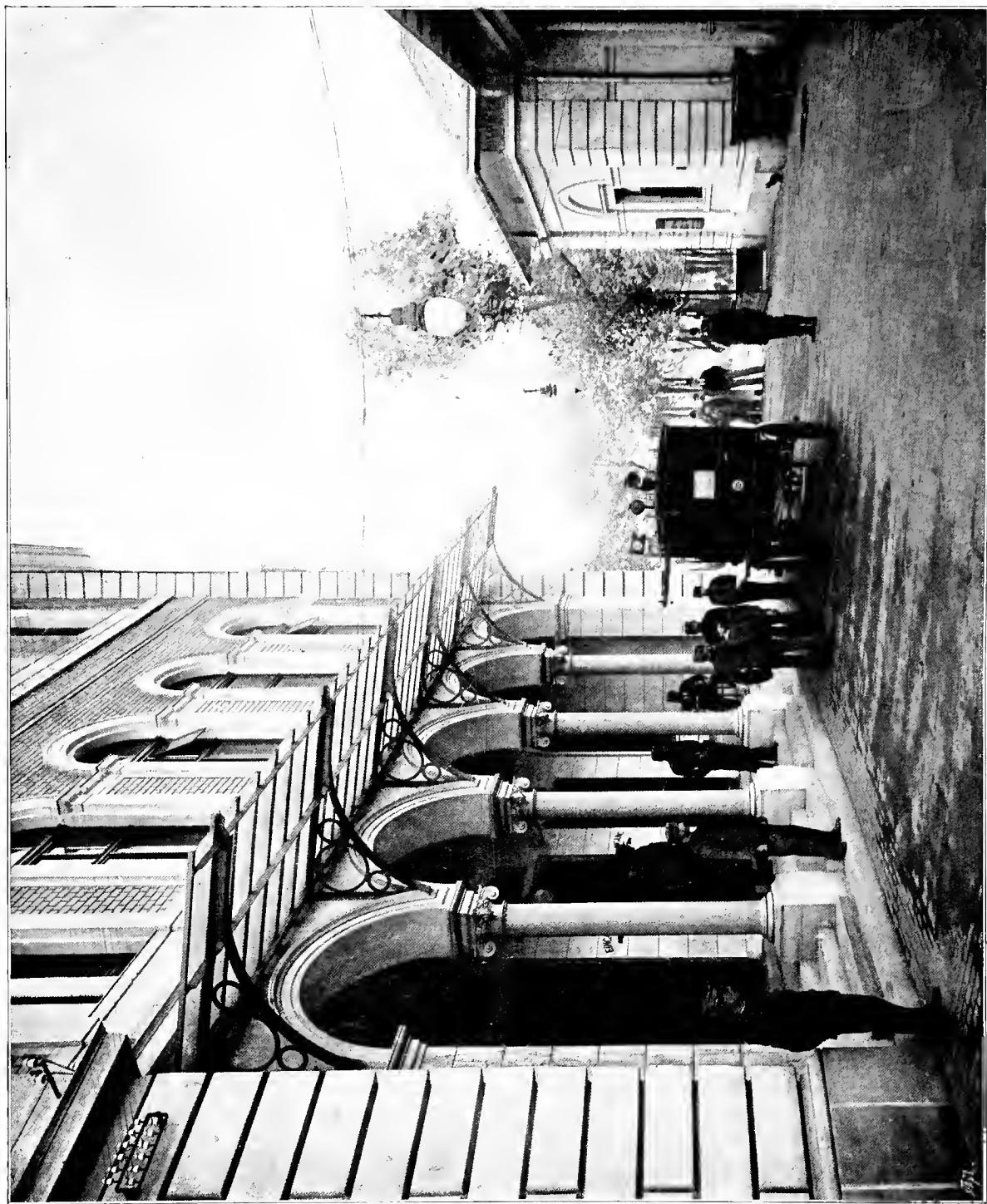


Fig. 18.—THE MAIN ENTRANCE OF THE VIENNA AMBULANCE SOCIETY'S HEADQUARTERS.



Fig. 19.—THE "TURN OUT" COACHHOUSE AT THE VIENNA AMBULANCE SOCIETY'S HEADQUARTERS.



FIG. 20.—THE WATCH ROOM AT THE VIENNA AMBULANCE SOCIETY'S HEADQUARTERS.

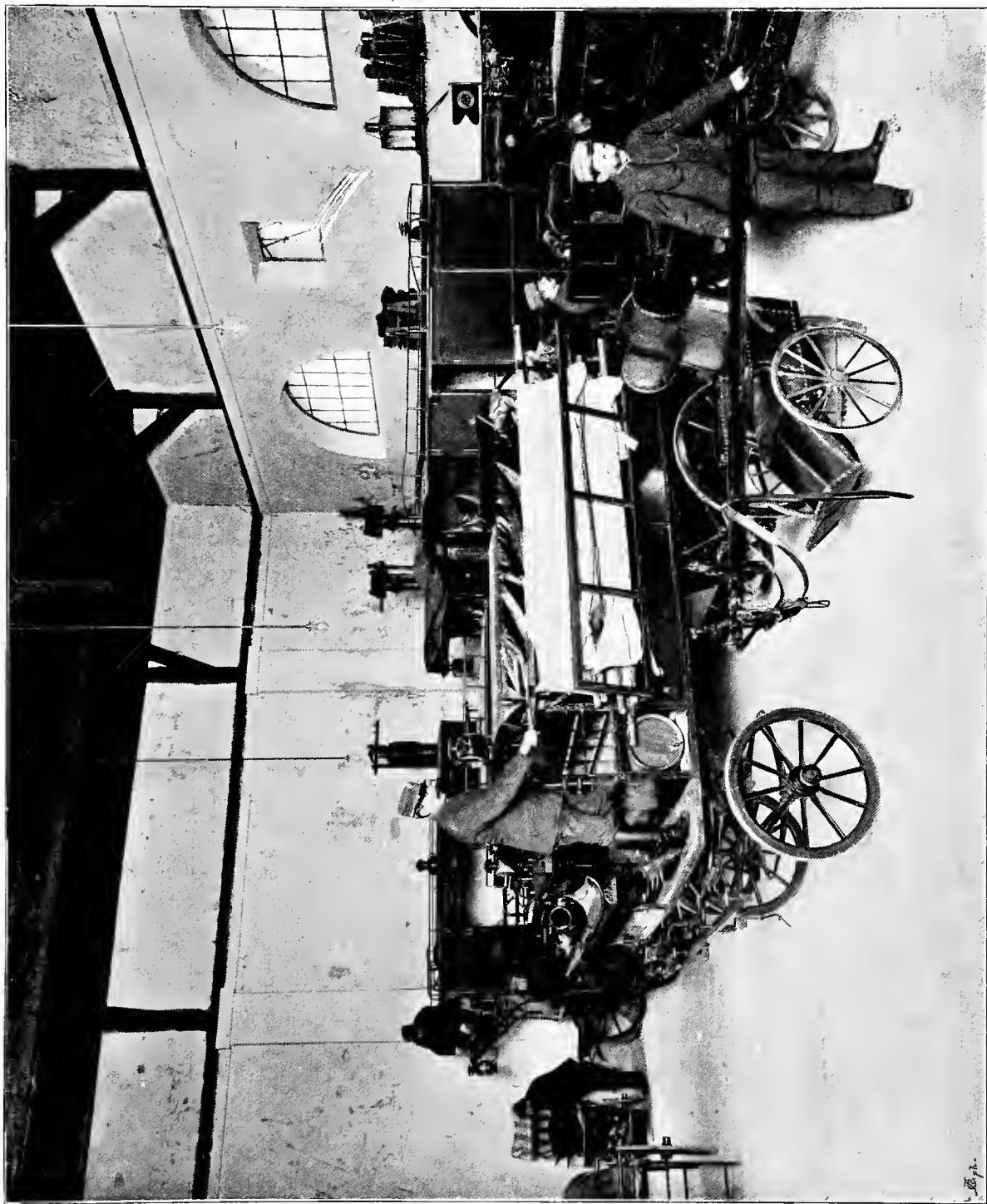


Fig. 21.—COACHHOUSE WITH RESERVE EQUIPMENT AT THE VIENNA AMBULANCE SOCIETY'S HEADQUARTERS.



Fig. 22.—THE ACCIDENT WARD AT THE VIENNA AMBULANCE SOCIETY'S HEADQUARTERS.

*Diary.***Monday, Aug. 15th.**

VIENNA.

(Visit to the Central Station of the **Vienna Volunteer Ambulance Society**, *continued.*)

Technical Notes.

The *Fire Service* comprises several of the Vienna Suburban Volunteer Fire Brigades. A certain proportion of the men of these brigades (400 all ranks) are organised to do duty for the Ambulance Society, also outside the metropolitan area if called upon.

The *Flood Service* comprises 149 men from the leading rowing clubs. This Section has its own punts, pontoons, and food distributing vehicles.

The *First-Aid Service* comprises 14 paid doctors, 325 doctors doing voluntary service, 60 medical students, 3 Ambulance Superintendents, 12 ambulance men, and 6 coachmen. First-Aid Service

The following are some notes on the Society:—

The Society carries on its work from the Headquarters station centrally situated, comprising a large administrative block, and with coach-houses and stabling for 19 horses.

The ground floor of the administrative building is primarily utilised for a watch-room, waiting rooms, duty rooms, an accident ward, and an operating room. The first floor is occupied by offices, class-rooms, and a tenement. The watch-room is well equipped with telephones for ordinary telephone service and communication with the Police, Fire Brigade, and other authorities.

The first-aid carriages turn out with a doctor, coachman, and two ambulance men.

The Society turns out to railway accidents within 300 miles from the capital, the arrangements for such "turn out" being in the form of standing orders.

To meet great emergencies the Society can count immediately upon the assistance of 50 of its doctors, 200 volunteer ambulance men equipped with 26 ambulance carriages, 250 stretchers, and a large number of minor appliances.

The Society does considerable service of an educational character.

It is administrated by an Executive of thirteen, and the Executive management is in the hands of the chief Medical Officer.

The Society is supported in the main by voluntary subscriptions, its annual expense being 134,000 crowns. In a period of eighteen years of existence, its income has been 3,000,000 crowns, and its assets at present are, beside its Headquarters (costing 600,000 crowns), its stores (costing 300,000 crowns), a cash reserve of 800,000 crowns.

The *Vienna Water Supply* seemed to meet the city's fire brigade requirements very satisfactorily, so that steam fire engines have seldom to be used. There are 3,620 hydrants, a few off standards, the rest underground, with an average pressure in all parts of the city from five to six atmospheres. The jets worked during the display at the *Vienna Fire Brigade Headquarters* were good ones. There were four deliveries brought into action—one from ground, two from roof of building (second storey high), and one from top of escape 70 feet high—the water being taken off two hydrants in the Station Yard. In the afternoon at a display at the *Döbling Volunteer Fire Brigade Station*, five jets of water were brought in action—four from roof of station buildings and one from the top of a 50-foot escape. A splendid supply of water was obtained from two hydrants—one in the Fire Station Yard and one from the street. Döbling is on higher ground than the "Headquarters." At *Heiligenstadt* there was no wet drill, but the information was to the effect that the water pressure was good. Generally no complaint whatever was made as to water pressure, distance of hydrants, etc., but a general wish expressed by the officers that the number of standard hydrants be increased. Water

Diary.

Monday, Aug. 15th.

VIENNA.

The Imperial "**Hofburg**" **Theatre** was next visited, where a considerable time was spent under guidance of an official of the Lord Chamberlain's Office and the chief-engineer and the fire-master of the building. The **Town Hall** and its "**Rathhaus-keller**" were also visited. Luncheon at the Hotel.

Technical Notes.

The Vienna "**Hofburg**" *Theatre* was far and away the finest piece of Theatre architecture seen *en route*. In plan, arrangement, design, decoration, and equipment it is unrivalled. The exits seemed ample.

It is, however, subject to a considerable risk of fire through antiquated electrical installation. The switch-room on the stage is one of the most dangerous the members of the party have seen. Besides being dangerous electrically, it is highly inflammable, and lined with matchboarding. There was much unnecessary matchboarding and wood-work in the Theatre.

It appeared curious that a building such as the *Vienna Hofburg Theatre*, on which such an immense sum of money had been spent, should contain defects so palpable that they are inexcusable.

The staircase from the stage to the Mezzanine was very antiquated, and capable of much improvement.

The stage was about 23 metres deep, *viz.*, from the curtain to the back wall. There was an opening in the back wall on to a back-stage, used to make the stage deeper for certain effects. Both this opening and the proscenium opening were fitted with Iron Curtains constructed of a framework covered with corrugated iron sheets.

The stage was fitted below the Gridiron floor with a system of pipes perforated at intervals, forming a sort of dry pipe sprinkler, or "drencher" arrangement, it being possible to turn the water into the pipes at the stage level, but not, as far as could be learnt, from any other part of the house. The theatre has its own fire brigade.

There were four tiers of "flies," but no water-pipes could be seen under these, nor under the stage.

Much of the decorative work of the Box fronts was of stamped metal.

The *Vienna Rathaus* was of considerable architectural interest.

A slight basement fire had occurred just before the arrival of the party, and the Vienna F.B. "turned out" to it in force. The appliances seen travelling to this fire did not, however, travel at any considerable speed from an English point of view.

A permanent "watch" from the Vienna F.B. is kept at the Town Hall. Evening "watches" are posted in all theatres.

Theatre**Theatre Exits****Theatre Iron Curtains****Theatre Sprinklers****Town Hall Fire Watch****Theatre Watches****Suburban Volunteer Fire Brigade****Rural Volunteer Fire Brigade**

In the afternoon, the Commission went by the Electric Motor "Trap" of the Vienna M.F.B. to the **Döbling Volunteer Fire Brigade** Station in the suburbs, and at 3 p.m. inspected the Station and appliances and witnessed a drill. Then the Commission visited the **Heiligenstadt Volunteer Brigade** and saw a turn-out.

The party was finally driven to the railway station for **Kahlenberg**, which they reached by Cog-wheel train about 5.30 p.m. This eminence overlooking Vienna and the Valley of the Danube afforded a splendid panorama. Dined at the Kahlenberg Hotel. The party then returned by Cog-wheel train and tram to the Hotel.

A storm (with some lightning) threatening, but it passed over. Quiet evening at the Hotel.

An excellent club-room was a feature of the station.

The **Heiligenstadt Fire Brigade** was a rural volunteer one situated in the Vienna outer area, and equipped by the Vienna municipality. Its station had only been opened a few days previously. The Brigade was turned out under service conditions, the horses being brought from the local jobmaster, and the men being called from their homes by electric bell alarms.

They turned out in about four minutes with two appliances.

They had trouble with their horses, which appeared unaccustomed to the work.

Diary.

Tuesday, Aug. 16th.

PRESSBURG.

Breakfast at 6.30 a.m. The Commission **left Vienna** for **Pressburg** by 7.55 a.m. train, in reserved carriages, and **arrived at Pressburg** 9.16 a.m.

The Commission was met at the Station (together with other Congress delegates travelling by this route), by *Count Victor Szechenyi*, and other Congress Officials, together with the *Mayor of Pressburg* and the *Governor of the District*, who welcomed the visitors to Hungary. Speeches were delivered by delegates from various countries, and courtesies interchanged, after which conveyances were provided and the whole of the Congress delegates present were driven to the Pressburg Fire Brigade Station, where they were entertained by the Municipality to a light Luncheon.



Fig. 23. — PRESSBURG VOLUNTEER FIRE BRIGADE. DRILL WITH CHUTE.

Technical Notes.

The President of the Hungarian Fire Brigades' Union : *Count Victor Szechenyi*.

The Chief Officer of the Pressburg F.B. : *János Szedlein*.

The Hungarian Fire Brigades' Union comprises 1,325 brigades out of the total of 8,544 brigades in the country. The Hungarian Union is divided into districts or counties, and thus there are twenty-one county associations in the Hungarian Union.

Nearly all the brigades affiliated to the Union join through the medium of the County Associations, but there is also a central district, in respect to which the brigades join the headquarters of the Union without the intermediary of the County.

The direction of the Union is in the hands of an Executive, a County Committee, as it is called, and a General Assembly. The Executive comprises a president, vice-president, secretary, treasurer, and ten specially elected referees. The Executive as such, serves as the board of experts, to which the Minister of the Interior applies when technical questions have to be dealt with.

The Union accords much attention to questions relating to the *Instruction of Fire Brigade Officers* throughout the country.

It arranges a *Course of Fire Service Instruction* every year, and each course lasts for three weeks. These courses of instruction are very much on the lines of the so-called School of Instruction which our Volunteer Officers attend at Wellington Barracks, and no Fire Brigade Officer can apparently any longer attain Chief Officer's rank in a Union brigade without having passed through a course and having attained a pass certificate. This regulation, however, is not retrospective, *i.e.*, only affects future chiefs. No less than twelve courses have already been held, and 414 Fire Officers have pass certificates.

Beside the instruction accorded to Fire Brigade Officers on the active list, instruction is also accorded by the Union to the *personnel* of the Municipalities or Rural District Councils who propose taking appointments as Officers of Obligatory Fire Brigades, and no less than 2,087 such local officials have passed the course and hold the necessary certificates.

As to the Union's general work, they have systematised all questions of uniform and badges of rank; they have created a long-service medal; they have issued clear instructions for competitions, and a Guide for the Testing of Fire Extinguishing Appliances. A *Uniform Coupling* or *Standard Junction Piece* is used throughout the country, and there is a *Standard Manual Fire Engine*. The uniform of the officers of the Hungarian Union is a particularly neat one of dark cloth, the jacket being of the "jumper" type.

A *Benevolent Fund* has been formed. The Benevolent Fund, in the first place, receives a compulsory due of 2d. per man from every fireman belonging to the Association, besides voluntary donations.

Regarding the general expenses of the Hungarian Union, it would appear that besides the 11,000 crowns they receive from the Hungarian Government, about 4,000 crowns reach the Treasury in the form of contributions from the Brigades.

Fire
Brigade
Associa-
tion

Instruc-
tion of
Fire
Brigade
Officers

Instruc-
tion of
Municipal
Officials

Standard
Couplings
and Junc-
tion Pieces

Benevo-
lent Fund

Diary.

Tuesday, Aug. 16th.

PRESSBURG.

The Visitors thereupon inspected the *Pressburg Fire Station* and appliances, inscribed their names in the Visitors' Book, and were photographed. Conveyances were provided for a drive through and around the town, and up to the historical **Pressburg Castle**, commanding an excellent view over the city. The party then drove to the **Town Hall** to witness a fire brigade display and demonstration of the water pressure available at Pressburg. They then drove over the Danube and by way of the **City Park to Palugyay**, a riverside Hotel, to attend a formal (open air) Luncheon on a terrace overlooking the Danube. There were speeches during the course of the luncheon, and a Hungarian Military Band played at intervals during this function. After Luncheon, the party inspected the wine-bottling **Stores** and **Cellars** of *Messrs. T. E. Hubert*, one of the largest establishments in Hungary.

Technical Notes.

The *Pressburg Fire Brigade* is a Volunteer force equipped by the **Volunteer Fire Brigade** Municipality. It has a very roomy Fire Station with excellent duty, class, and club rooms for the men, also a spacious drill yard. The Brigade was formed in 1867, and comprises 160 Volunteer Firemen with 6 retained men. A certain number of men sleep at the Station by turns. The equipment was modern and well kept. The general impression imparted was that the Brigade was well managed, well provided with funds, and had the pick of the younger townsmen for its members. The display given with an 80-ft. long ladder at the Town Hall, when the water pressure off the hydrants demonstrated, was carried out in a very businesslike way. The men worked quietly and smartly. The Brigade has its own Benevolent Fund, with a capital of about £4,000. The members of the Brigade are also insured against all accidents. In any case the relatives of a deceased fireman of five years' standing receive 400 crowns towards the funeral expenses from the Benevolent Fund. The Brigade is supported by voluntary subscriptions, but also receives an annual grant from the Municipality apart from the provision of the appliances and fire station. **Benevolent Fund**

The fire engines of the *Pressburg Volunteer Fire Brigade* are **Horses** horsed by twenty-two pairs of horses belonging to the Municipality, which are always at the brigade's service, and are stabled in a building opposite the Fire Station.

In the *Pressburg Fire Brigade's* display, water was obtained from hydrants only; the pressure was $6\frac{1}{2}$ atmospheres. Two jets were taken from street, one from balcony, and one from top of 80-ft. long ladder. The streams were all exceptionally effective, showing well-designed nozzles to branches, and there were no leaks at hose or in joints. **Water**

The *Bottling Stores* seemed to be exceedingly well laid out, fairly divided up into separate risks and exceptionally neatly kept. Special care appeared to be taken as to loose straw, packing materials, etc. The cellars require additional emergency exits. **Bottling Stores and Cellars**

The Commission, together with the other Congress delegates, **left Pressburg** in reserved carriages by the 4 p.m. train for Budapest. The Commission **arrived at Budapest** about 8 p.m., and were met by a party of officers of the Hungarian Fire Brigades' Union. The Commission drove to the *Hôtel Hungaria*, where quarters were reserved. Supper at the Hotel.

Diary.

Technical Notes.

Wednesday, Aug. 17th.

BUDAPESTH.

Breakfast at 9 a.m. A deputation from the Commission called on the *British Consul-General* and reported the arrangements for the stay at Budapesth. The deputation then reported the party at the **Congress Offices**, Vaczi-uteza, 62, obtaining cards, programmes, and other information.

The British Consul-General at Budapesth : Mr. Francis Stronge.

The *British Consul-General* kindly offered every assistance to the Commission, whose visit had been notified him by the Foreign Office. The deputation thanked him for his courtesy and accepted an invitation to luncheon.

The *Principal Congress Secretaries* were : *Constans de Breuer, Dr. Josef Szily.*

The *Budapesth Congress Office*, which was at the Town Hall, was **Congress** very well organised, and all papers, particulars, etc., were available at short notice for the various Congress members calling.

All *Congress Papers* were obtainable in proof in the German, French, and English languages, besides Hungarian.

A *Daily Programme* was issued in these four languages. The programme was altered somewhat materially at the last moment from the one originally issued, which was a matter of inconvenience to some of the foreign visitors who had private friends to visit at Budapesth.

**Congress
Pro-
gramme**

The Chief Officer of the Budapesth Professional Brigade : Stanislaus Szerbowiski.

There is a combination of a professional force and a volunteer force at *Budapesth*. Besides there is an auxiliary service of Factory Fire Brigades.

**Combined
Profes-
sional
Volunteer
and Fac-
tory Fire
Service**

The *Professional F.B.* possesses a central station and eight substations, two minor stations and permanent theatre-watch-rooms at the Royal theatres. The principal figures are as follows :—

The staff, in 1901, of the professional brigade consisted of a chief officer, an inspector, a senior adjutant and two junior adjutants, a clerk, and further 23 warrant officers, 3 engineers, 15 foremen, 154 firemen, and 30 coachmen with 62 horses. There have been some slight increases since. The apparatus at their disposal consists of 6 steam fire engines, 22 manual engines, 27 small manual engines, 11 water carts, 13 traps, 4 tenders, 26 hose reels and hose carts, 5 long ladders, 9 ordinary extension ladders, 34 hook ladders, 12 smoke helmets, and 22,000 metres of hose.

The various stations are connected with the central station by private telephone lines. There are 149 telephonic fire alarms distributed throughout the city. They are on radial lines connected up with their respective nearest stations, and on a single radial line there are from three to seventeen call-points.

**Profes-
sional Fire
Brigade
Equip-
ment**

The *Budapesth Fire Brigade Headquarters* are very roomy. They comprise a large block of buildings with a central quadrangle. The Station is conveniently planned. The gear of the *Budapesth Volunteer Brigade* is housed in special coach-houses at Headquarters. The school of instruction for the provincial Volunteer Force which is worked in conjunction with the Volunteer Brigade from Headquarters has special rooms.

Fire Call

A room at Headquarters, used as a class-room for the men, is admirably fitted with models, samples of appliances, etc.

**Volunteer
Fire
Brigade**

The general equipment of the *Budapesth Professional Brigade* does not accord with modern requirements. The Brigade is to be shortly re-equipped.

The *Budapesth Volunteer Brigade* has a new *Benzine Motor Engine*.

**Benzine
Motor Fire
Engine**

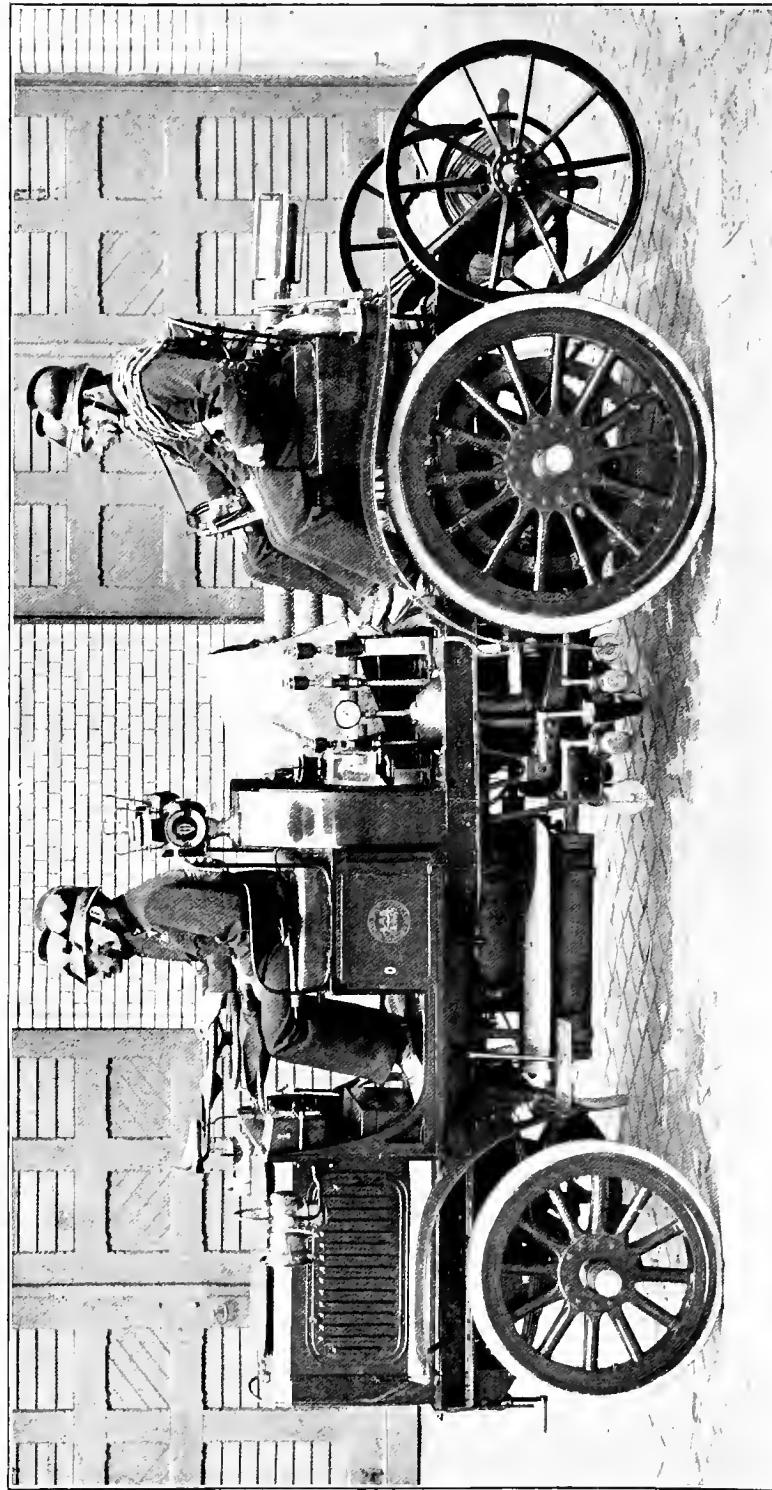


Fig. 24.—BUDDAPEST VOLUNTEER FIRE BRIGADE. BENZINE MOTOR FIRE ENGINE.

By courtesy of "Engineering."

Diary.

Wednesday, Aug. 17th.

BUDAPESTH.

(Visit to the Chief Fire Station of the **Budapesth Fire Brigade**, *continued.*)

Technical Notes.

As indicated, the *Professional Brigade* is supplemented by a *Volunteer Brigade* which has an independent constitution and comprises some eighty members. Its equipment is housed with that of the Professional Brigade, and the equipment is bought and maintained by the Municipality.

This *Volunteer Brigade* is a comparatively wealthy institution, having a capital of 100,000 crowns, whilst receiving a special subsidy annually from the Municipality. Though legally an entirely independent institution, the Brigade voluntarily puts itself under the command of the Chief Officer of the Professional Brigade. It further puts daily at the disposal of the Professional Fire Chief ten men who do duty every night and "turn out" when called upon to render service. This *Volunteer Brigade* stands as a kind of model to the other *Volunteer Brigades*, and it is in connection with this *Volunteer Brigade* that the educational classes referred to above are held and facilities accorded to the officers undergoing instruction to gain experience at the Budapesth Fires.

Volunteer
Fire
Brigade

The *Budapesth Professional Fire Brigade*, even if assisted by the *Volunteer force*, would scarcely be of adequate strength to deal with the great factory risks of that city were it not that the Budapesth factories and mills have a splendidly organised service of *Factory Fire Brigades*.

Factory
Fire
Brigades

These brigades—forty-four in number—are essentially private institutions intended to render self-help in the factory to which they belong, but they are well organised, and have a mutual understanding whereby the neighbouring brigades of any one factory immediately turn out and assist in case of need.

These factory brigades have a total staff of 1,600 men.

They are equipped with 1 steam fire engine, 57 large manuals, 136 small manuals, and have a very considerable amount of small gear, including 15 smoke-helmets.

Eight hundred and sixty *Fixed Iron Scaling Ladders* have been fitted to factories, mills, etc., under supervision of the Brigade.

Fixed Iron
Scaling
Ladders

In the afternoon the party assembled in the Hall of the Hotel at 3.30 p.m., with other Congress Members for a visit to the King's new **Royal Palace at Buda**, over which they were conducted by the *Governor of the Palace* and by *Count I. Széchenyi*, and on concluding the visit, the Members of Congress attending, were photographed on the Terrace of the Palace. At 5 p.m. there was a meeting of the *Executive of the International Fire Service Council*, which was attended by *Mr. Sachs*. Dinner at the Hotel at 7 p.m. After Dinner there was an informal social meeting of Members of Congress at Viovace's Restaurant in the **Varosliget** (Town Park). The Members of Congress next assembled about 11 p.m., at the "**Octagon Place**" to witness a night "turn-out" of the Budapesth Fire Brigade. *Mr. Sachs* gave the alarm by telephone from an adjoining Café and the Brigade turned out in full strength, amid considerable popular excitement.

Besides the two permanent *Theatre Watches* provided by the brigade which are strengthened of an evening for the performance, theatre watches are provided by the brigade during the performance at all other theatres at Budapesth.

Theatre
Watches

The *Budapesth Fire Brigade*, in "turning out" and attending at Octagon Place, travelled at a very rapid pace. The provision of each vehicle with a burning torch in addition to the ordinary lamps, besides being picturesque, is of considerable value in ill-lighted thoroughfares, and on country roads in particular.

"Turn
Out"

The *Budapesth police and traffic arrangements* on the occasion of this "turn out" were extraordinarily unsatisfactory, but the crowds were very good-natured, and made way for the firemen.

In ringing up Headquarters from the *Café* with a view of putting through a call, it took 1 min. 45 secs. to obtain the connection, of which the first 50 secs. were required to obtain a response from the local exchange.

Fire Call
(Tele-
phone)

*Diary.***Thursday, Aug. 18th.****KING OF HUNGARY'S BIRTHDAY,
BUDAPESTH.**

Breakfast at 7 a.m. The Commission left the Hotel at 7.45 a.m., and drove to Buda to see the **Military Birthday Parade** on the **Vermezo Place**, special places being provided for the Members of Congress. The party then returned to the Hotel, and drove to the opening of the **Congress** at the **Town Hall** at 11 a.m. Count Victor Szechenyi introduced the Secretary of State, Mr. Ignacy Szell, who opened the Congress as representative of His Imperial Highness, the Archduke Joseph. He was accompanied by a representative of the *Minister of the Interior* and by Mr. Almady, Municipal Councillor, representing the Mayor, who both welcomed the foreign visitors in Hungarian. Count Szechenyi further welcomed the visitors in the name of the Hungarian Fire Brigades' Union, speaking in Hungarian, German, French, and English. The cordial reception accorded to the Members of the Congress was then acknowledged by *M. de Marie* (in French) on behalf of the International Fire Service Council; by *Chief Officer Westphalen* (in German), and *Mr. Edwin O. Sachs* (in English).

The following papers were read and discussed:—(a) The Baltimore Fire, by *Richard Leupold* (U.S.A.) and *Ellis Marsland* (London). (b) The Modern Theatre, by *Stanislaus Sczerboiewski* (Budapesth), and *Edwin O. Sachs* (London), and *Conlaus von Breuer*.

Technical Notes.

The Commission respectfully tendered, by telegram, their *Congratulations to His Imperial and Royal Apostolic Majesty* on the occasion, which congratulations were duly acknowledged with a gracious expression of thanks through the *Austro-Hungarian Embassy in London*, on the Commission's return to England.

The *Military Parade at Buda* was of considerable interest; it comprised all arms. There was an inspection and a field church service. In the *ten de joie* some of the volley firing was remarkably good, but some was also peculiarly ragged. There was a march past of good alignment.

Patron of the Congress: *His Imperial Highness, Archduke Joseph.*

The *Budapesth Congress Membership* was considerable, but mainly Hungarian. There were some 150 foreign visitors, of whom the British Commission (9+1) was the only one attending and working as a special organisation. The Belgian and Italian visitors travelled in parties, but had no special programme of work. The other visitors attended independently. A number of Continental Governments and Municipalities were officially represented.

Questions of precedence, the reserving of seats, etc., which are matters of considerable import to some Continental nationalities, required more consideration at Budapesth, although the Members of the British Commission had nothing whatever to complain of as far as they were concerned.

The *Language difficulty* throughout at Budapesth was considerable, and makes it advisable to preferably select cities in which either the French, German, or English languages are the local language for gatherings of this character.

It was regrettable that so important a subject as the *Baltimore Conflagration* was not in the hands of an American representative of structural experience and technical knowledge, preferably a Building or Insurance Surveyor.

It would be advisable that arrangements should be made by which the *Representation of the United States* at European conferences should be placed in able and representative hands, as was the case at the London Conference, but has not been the rule at conferences on the Continent of Europe; further, that the American Societies and Associations should duly intimate to the local organisers of such congresses whether they are represented or not, as there have frequently been regrettable misunderstandings in this direction which has not been to the benefit of the allied services of the United States.

Congress

**Congress
Repre-
sentation
from the
United
States**



Fig. 25.—THE PARISIEN STORE FIRE, BUDAPEST.⁷ (VIEW NOS. 38 AND 40 KEREPESERSTRASSE AFTER THE FIRE.)



Fig. 26. THE PARISIEN STORE FIRE, BUDAPEST. (VIEW OF THE CORNER OF NO. 38 KEREPESERSTRASSE ON THE GROUND FLOORS AFTER THE FIRE.)

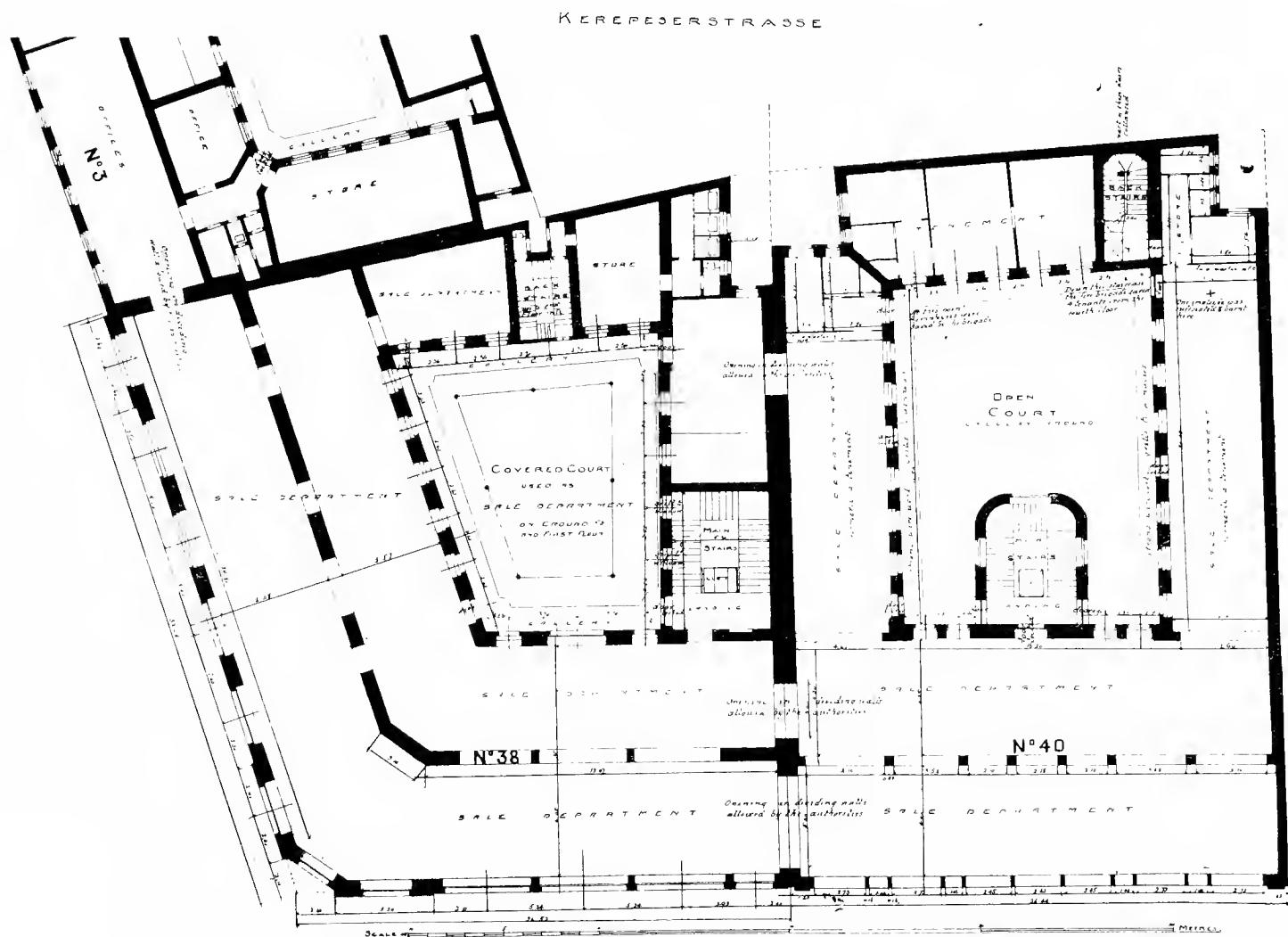
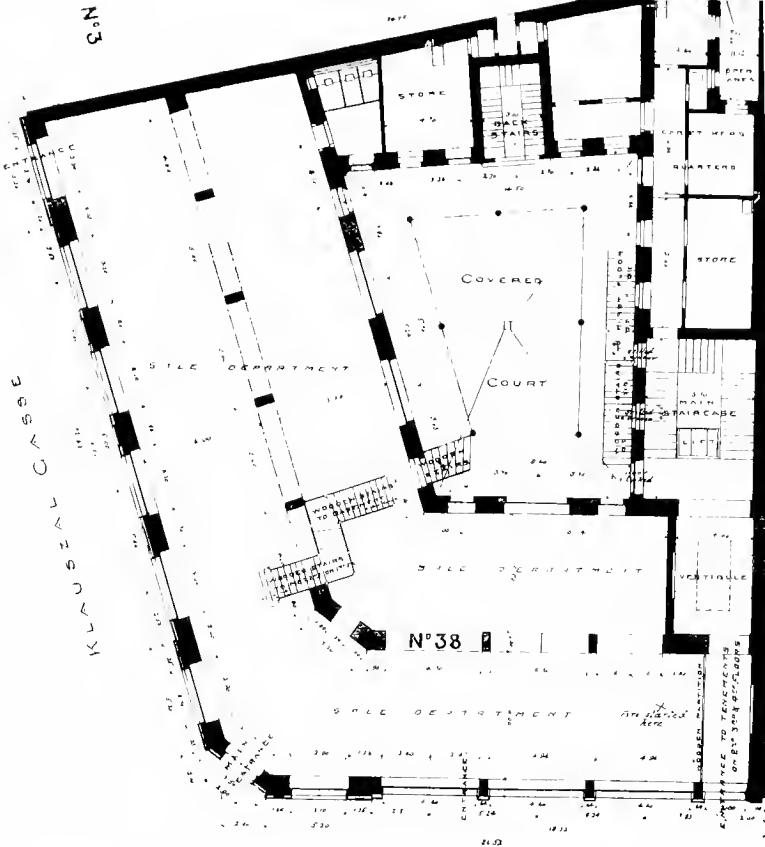


Fig. 27.—THE PARISIEN STORE FIRE, BUDAPEST. PLAN OF GROUND AND FIRST FLOORS.

Diary.

Thursday, Aug. 18th.

KING OF HUNGARY'S BIRTHDAY.
BUDAPESTH.

The Commission thereupon returned to the Hotel. Luncheon at the Hotel at 1.30 p.m. Count and Countess Victor Szechenyi gave a private luncheon at the **Park Club** which was attended by *Edwin O. Sachs* (for the B.F.P.C.) and *Horace Folker* (for the N.F.B.U.).

Messrs. *Sachs* and *Folker* then drove to the site of the "**Parisien Store**" fire of 1903, to inform themselves of its location and the general state of the building.

Technical Notes.

The "*Parisien Store*" Fire took place in a block of buildings at the corner of Kerepeserstrasse and Klauszalgasse. The basement, ground and mezzanine floors were devoted to business premises and the four upper floors to residential flats. There was an open courtyard in the centre of the block, for the purposes of light and air to the residential portion. The residential portion was approached by an entrance hall and staircase from the street, and at each floor level open galleries around the open court gave access to the several suites of apartments; an additional flight of stairs at the rear of the courtyard also leading off the galleries and communicating with the basement served as the service staircase.

The proprietor of the business premises on the ground floor and basement, wishing to increase his accommodation, had converted the mezzanine floor, formerly devoted to residential suites, into business premises by removing the internal partitions, and also rented the mezzanine floor of the two adjoining blocks, cutting large openings in the party wall. The open court before mentioned was then roofed over at the floor level above the mezzanine and the door openings on the ground and mezzanine floor leading on to both the front and back staircases were closed, and the windows from the front staircase looking into the business premises thus formed were secured against entry. The store premises were stocked with drapery goods, haberdashery, costumes, etc.

This was the condition of things when the fire started at about 7 p.m. on August 24th, 1903.

The partition dividing the business premises on the ground floor from the main entrance to the residential portion above was mostly of wood, and unfortunately the fire started in the business portion of the premises (alleged by the fusing of an electric lighting wire) close to this partition, through which it quickly passed, cutting off the escape of the tenants of the upper part in this direction. The fire spread and involved the whole of the business portion of the block, and coming up through the glass roof over the central court entered the residential parts above.

The tenants, having their escape by the main staircase cut off and the small rear staircase being unavailable by reason of its terminating at the lower end in the business part which was in flames, had no other means of escape except the windows overlooking the street to which they repaired. Before the arrival of the Brigade, three persons had jumped and lost their lives. After the arrival of the Brigade, 26 jumped of whom 9 lost their lives, 1 was uninjured, and 16 seriously injured. The fire escapes and jumping sheets (owing to the fierceness of the flames in the business part) were unable to be efficiently used.

The floors of the building were fire-resisting, and the ironwork was encased with fire-resisting material, so that with the exception of some of the stonework to the front and the stone stairs, the shell of the building was comparatively little damaged.

The fire also extended to the adjoining block by means of the openings in the party walls in the mezzanine, but the consequences were not so serious as in the block where the fire originated.

The moral is that if tenements are over business premises, every constructional means should be adopted to prevent a fire spreading from one section to the other.

Retail
Store
Buildings

The
"Parisien
Store"
Fire

Combi-
nation of
"Stores"
and
Tenements

Structural
Alter-
ations
Involving
Risk

The
Outbreak
of the
Fire

Exits from
Tenements
Cut off

The **Municipal Waterworks** were visited in the afternoon, special electric trams being reserved to take the visitors. Heavy thunder-storm and rain during afternoon.

The Commission attended in the evening, at 8.30 p.m., the **Official Banquet** to the foreign visitors at **Viovace's Restaurant** in the Varosliget (Town Park). The banquet was in a partially covered pavilion. There was a rain storm in the evening.

*Diary.***Friday, Aug. 19th.**

BUDAPESTH.

Breakfast at 8 a.m. The Commission attended the **Congress Meeting** at **Town Hall**. Papers were read and discussed on—(a) Mechanical Ladders, by *Herr Herzog* (Hamburg). Discussion opened by *Sig. Goldoni* (Milan). (b) The Motor Car in the Service of the Fire Brigade, by *Mr. Ratincky* (Seharbaek). (c) Fire Alarms, by *Mr. Sheppard* (London). Luncheon at 2 p.m. at the Hotel. *Messrs. Sachs, Marsland and Collins* were entertained at a private luncheon by the *British Consul General*.

In the afternoon at 3 p.m., a visit was paid to the **Royal Opera House** to inspect the stage sprinklers in action, the whole of the stage being deluged with water, numerous branches also being brought into play. At 3.40 p.m. *Messrs. Sachs, Sheppard and Collins* visited the scene of the “**Parisien Store**” fire, and went over the building in course of reconstruction.

At 4.15 p.m. a visit was paid to the **Volunteer Ambulance Society's Station** in the Markouteza, where the Commission witnessed a “turn-out” as if for a big railway accident, and carefully inspected the Station and the whole system explained by *Dr. Aladar Kovach, M.D.*, who furnished the party with a short account of the Station printed in English.

Technical Notes.

The *Budapesth Opera House* has a good supply of hydrants and **Theatre water** in case of fire. Perforated Pipes, serving as Dry Pipe Sprinklers, are fitted under the Gridiron of the stage: the tanks for supplying same have a capacity of 95 cubic metres. If the whole of the Sprinklers are turned on simultaneously, the water in the tanks would last 18 minutes. There are 24 hydrants in this building, always under a pressure from 2 to 2.75 atmospheres; this is indicated by water gauges. In case of emergency a higher pressure can be obtained off these hydrants by aid of two gas-motor driven pumps, which can increase the pressure up to about 7 atmospheres on ground and first floors, and 5 atmospheres on the third tier. A remarkable display was given, the Sprinklers being used with very good effect. Four deliveries were also brought into action from the stage; also three deliveries from the first fly galleries; also two from the second fly galleries, one hydrant being opened to serve each delivery. The *pressure of water* from all branches was exceedingly good. The stage was literally flooded out, so that no fire could have lived in this deluge.

The *Budapesth Volunteer Ambulance Society*, which was formed in 1887, provides first-aid and ambulance carriage services for Budapesth. It is further organised to assist the authorities in cases of great emergencies, and in such instances extends its usefulness beyond the boundaries of Budapesth.

As far as the ambulance service is concerned, the primary principle of the force is to turn out rapidly with a horsed ambulance, carrying a doctor and ambulance man, and a coachman, so that first-aid may be rendered in a skilled manner, and the injured person then rapidly transported, either to the Ambulance Society's Headquarters, to a hospital, or to his private residence, as the case may require. The Ambulance Society's Headquarters being sufficiently extensive to provide accommodation for a number of accident cases.

The following are some particulars:—

The Municipality provided the Society with its Headquarters Station in 1890, at a peppercorn rental. It has since been enlarged, and **First-Aid Service**

*Diary.***Friday, Aug. 19th.**

BUDAPESTH.

At 5 p.m. the Commission witnessed an elaborate Fire Brigade Display at the ***Flour Mill, Clotild-uteza.*** The private factory fire brigade of the flour mill turned out, they were reinforced by factory brigades from adjoining mills called by telephone, and finally by the Professional and Volunteer Fire Brigades who sent various appliances, including a large steam fire engine and a petrol motor engine. The fire was supposed to be in one of the mill buildings, and was attacked from points of vantage on the roofs of adjoining buildings. After the display, the proprietors of the mill entertained the Members of Congress attending the display. A photograph of some of the Commission was taken.

At 8 p.m. the Commission attended an ***Official Open-air Banquet*** to the Foreign Visitors on the ***Margaret Island*** (at the Lowes Restaurant). Various toasts were given and responded to by the Delegates of the several nationalities present. *Messrs. Max Clarke, Percy Collins, and James Sheppard*, obtained the signatures of many of the guests in the *British Fire Prevention Committee's* autograph book, as a memorial of the occasion. The evening concluded with a firework display.

Technical Notes.

comprises some sixty-seven rooms and offices, with a courtyard of some 600 yards. Besides the provision of the building, the municipality grants the Society an annual subsidy of 20,000 crowns. Including this sum, the income, from all sources, of the Society is about 85,000 crowns p.a., *i.e.*, including income from interest on legacies, donations, subscribers' fees, fees paid for the transportation of the sick as distinct from accident cases. The capital of the Society is about 400,000 crowns.

The Society comprises a large membership of various degrees : (a) "Honorary Members" (elected for special services rendered); (b) "Founders" who originally subscribed 400 crowns; (c) "Donors" who have contributed 100 crowns; (d) "Subscribers," *i.e.*, persons who subscribe annually, 6 crowns; (e) "Active Members," *i.e.*, persons actually engaged in first-aid work, be they Physicians, Medical Students, or Nurses. Active members have to pass the senior first-aid course, and wear a distinguishing cap.

Certain of the active members, *i.e.*, the workers, are paid; the majority give their services voluntarily. There is a third section who receive certain facilities in lieu of pay. These facilities comprise free board and lodging. Medical students of small means are thus afforded facilities for study and assistance, in consideration of their rendering first-aid services, which services, of course, includes night work.

Apart from the first-aid work, the transport of the sick is undertaken, fees being charged except in the case of the poor, who have the service free.

The Society does considerable educational work; no less than 20,000 ambulance class pass certificates having been issued by them.

The arrangement with Headquarters Station comprises a watch-room and duty rooms on the ground floor, with a first-aid ward adjoining. There are large stores and coach-houses, as well as stabling for nineteen horses. The floors comprise various offices, upper tenements for physicians and the secretary, and various students' rooms.

The work of the Society comprised 13,000 cases in 1903.

In this *Budapest Mill Fire Display*, the first two jets were got to work with extraordinary rapidity, *i.e.*, the two lines of hose were connected to a wall hydrant in yard, run up two iron scaling ladders to the roof of buildings about three floors high, the hydrants connected up with Mill pump and Mill pump started, within twenty-nine seconds from the alarm. Allowing even that everything had been prepared for this display, the smartness of the men in handling the gear and having no hitches was most remarkable.

The arrival of the *Auxiliaries* from the neighbouring factory fire brigades and from the professional Fire Brigade, was in the following order as far as gear was concerned:—Firstly, one-hand hose reel, then two-hand hose reels, then one steamer, then one 80-ft. long ladder, then one hose cart, then two steamers, then one Benzine motor engine, then three long ladders (each over 60 feet), then two manual fire engines. The manuals were not worked. The *benzine motor engine* jammed and stopped working through mishap of a piece of waste dropping into machinery.

The great agility in climbing on roofs and up scaling ladders on the part of the Factory Firemen was commented upon.

At the display given 22 deliveries were brought into use—4 from Pumps worked inside the building, 2 from Steam Fire Engines, 1 from the Benzine Motor Engine, the rest (15) from Hydrants about the mill yard and adjoining streets. In nearly every case the branches were carried on to the roofs at least two and three storey high. In all parts the supply and *pressure of water* was good.

First Aid Service

Flour Mills Combined Professional, Volunteer and Factory Fire Service Combined Turn Out

Diary.

Saturday, Aug. 20th.

BUDAPEST.

Breakfast, 6.30 a.m.

Attended at 7.30 to view the religious **Procession of St. Stephen** on the **Palace Hill**. Seats were reserved for the Commission on the Verandah of the Royal Castle.

At 10.30 a.m. the final sitting of Congress was held. The following papers were read and discussed: (a) The Non-Inflammability of Wood and Textiles, by *Herr Conrad Gantsch* (Munich). (b) Fire Prevention in Mills and Factories, by *Constans de Breuer* (Budapest). The various Congress Resolutions were thereupon read in English, German, and French by *Mr. Edwin O. Sachs* and translated into Hungarian, whereupon they were discussed and adopted with slight amendments. The proceedings terminated with various votes of thanks and concluding speeches.

At 10.45 a.m. (during the meeting), the British delegates met *Count V. Széchenyi* in one of the Congress rooms and presented him with a gold Cigarette Case with the names of the delegates inscribed thereon, with a suitable inscription as a small token of his kindness and personal attention to the members of the Commission. The Count was very gratified, and made a suitable response. At 11.30 a.m. the Commission visited the **Hungarian Fire Exhibition**. Luncheon at Hotel at 1 p.m.

Technical Notes.

The lecture of *Herr Gantsch* was illustrated by a demonstration as to the fire resistance and non-inflammability of various materials. *Herr Hertzog's paper* on long ladders on the previous day was illustrated by demonstrations with excellently-prepared working models. Such demonstrations add materially to the interest of papers presented at large gatherings.

An important suggestion in the discussion was made by *Lieut.-Colonel Fox*, that experiments be undertaken with a view of deodorising or changing the odour of treated textiles that are carbonising instead of burning, so as to avoid the smell of burning penetrating into the auditorium of a Theatre.

It is essential that the *Subject Matter of the International Fire Congresses* should be arranged by the International Fire Service Council, with due regard to the sequence of the subjects to be considered, so that subjects may not be duplicated, or subjects already dealt with be again brought forward at too short an interval.

All questions relating to fire preventive building dealt with at Budapest could obviously not bring forth much that is new, since the Conference in London in 1903 dealt with the subject so exhaustively; whilst, on the other hand, a great deal that was new might have been brought forward in suitable papers in respect to Motor Traction and Chemical Fire Extinguishing, Sprinklers and other Automatic Appliances, Petroleum Storage, etc.

A strict *Time Limit as to the Presentation of Papers* should be in force; the time should not exceed fifteen minutes if the papers are duly printed in advance and only extracts, i.e., the pith of the paper, actually presented. The waste of time in the presentation of papers in full at International Conferences of all descriptions is regrettable, as it is the discussion and debate on a given theme that is the valuable feature of such conferences, and the actual paper presented should only be given with a view of presenting the latest information on the subject and serving as a basis of such a discussion. Thus the oral presentation of historical data, etc., are out of place.

It is essential to obtain skilled *Technical Paid Interpreters*, who should be constantly in attendance, as the linguistic misconception of phrases or even words, frequently entirely spoils the effect of a discussion.

A small National Exhibition of Fire Brigade appliances was organised under the auspices of the Hungarian Union, at the Városliget (Industrial Hall), and was open to Congress members.

The Exhibition was limited to modern gear and improvements, the idea being that only gear should be shown that afforded the visitor some novelty. The Exhibition was thus a very small one, but showed many minor appliances of interest, though mainly having reference to the Hungarian Fire Brigade requirements.

Congress Illustration of Congress Papers

Subject Matter of Congress Papers

Time Limit for Congress Papers

Congress Interpreters

National Fire Exhibition

Diary.

Saturday, Aug. 20th.

BUDAPESTH.

In the afternoon at 2 p.m. *Mr. Marsland* and *Mr. Pritchett*, paid a private visit to the scene of the fire at the "*Parisien Store*." At 3 p.m. the *Houses of Parliament* were visited under guidance of several M.P.'s. At 4 p.m. the meeting of the *International Fire Service Council* was held at the Town Hall, at which *Messrs. Collins, Folker, Fox, Marsland, and Sachs* attended.

Technical Notes.

The meeting of the *International Fire Service Council* showed that there had been a considerable improvement in the representative character of the delegations, several of the Countries being most suitably represented by officers associated with the various services concerned, such as the Professional, Volunteer, and part-paid services, and the Fire Preventive Societies. Germany, Great Britain, Italy, and several of the other minor States are particularly well represented, the various services and societies of each of these individual countries having a suitable number of delegates. Belgium and France, unfortunately, only have delegates from their respective Fire Brigade Federations, and hence no delegates from their professional and technical services. Russia and the United States are quite inadequately represented. The roll call showed that the Council's membership comprised 16 countries with 88 delegates.

The possibility of absent delegates voting by proxy through the mouthpiece of delegates present, came into force on this occasion, but was not made use of.

The language difficulty made itself very apparent.

A considerable amount of time was wasted by unnecessary Time Limit in Debate lengthy contributions to the debate, and the three-minute time limit in the discussion should be made a rule.

The advisability of certain work being taken in hand by the Executive was discussed.

There was considerable discussion as to the advisability of only having general Congresses every three or four years, but it was eventually decided that the *Next Congress* should be held at *Milan* in 1906, at the invitation of the Italian Fire Brigades' Union.

At the suggestion of the Executive it was decided to leave the question of the election of President in abeyance, and that the duties of President be in the meantime carried out by the General Hon. Secretary. The four Vice-Presidents—*M. Cazier* (France), *Mr. Edwin O. Sachs* (England), *Count Victor Szczchenyi* (Hungary), and *Herr Westphalen* (Germany)—were re-elected for a period of four years. The General Hon. Secretary, *M. de Marie* (Luxemburg), was re-elected. In the place of *M. Rauter* (resigned), *M. Phillips* (Belgium) was elected treasurer. New members of Executive elected were *Messrs. Goldoni* (Milan), *Meier* (Amsterdam), *Colonel Meyer* (Copenhagen), *M. Makhowski* (Russia).

The *Budapesth Water Works* visited can apparently furnish the city daily with 240,000 cubic metres of water. The cost of providing water off the mains is 2.25 hellers per cubic metre. For fire-service purposes the water supply off the mains appeared satisfactory, but the filtering of the water very primitive.

The *Water Supply* provides a pressure from $2\frac{1}{2}$ to $5\frac{1}{2}$ atmospheres, according to the level. There are 4,860 street hydrants. Besides this, there are 2,430 large and 1,120 small hydrants in public buildings and factories. In respect to the latter, 119 stationary steam pumps belonging to the various factories can be attached to these private hydrants, so as to augment the ordinary pressure. In all, 7,290 large and 1,120 small hydrants are available, and of course use is made of the water supply obtainable from the Danube.

Very clear plans were printed on the *Theatre Programmes*, showing the building and the most rapid means of exit.

International Fire Service Council

Time Limit in Debate

Next Congress

International Fire Service Council Executive

Water

Theatre Programme Plans

Dinner at 7 p.m., and at 8 p.m. a visit was paid to the *Orpheum Theatre*.

*Diary.***Sunday, Aug. 21st.**

BALATON LAKE
(Platten See).

Breakfast at 7.15 a.m. At 8 a.m. the Commission travelled from Buda Station by special saloon to **Balaton Földvar**, on the border of **Lake Balaton**, arriving about 11 a.m. There was an official Luncheon on arrival, and a local reed instrument band in attendance, after which *Count K. Széchenyi* showed us over the Balaton-Földvar Estate, and his country house in the vicinity. A special steamer (with a Hungarian band on board) took the Congress visitors for an excursion on the lake to **Almadi**. A visit was paid to the Grounds and Baths at a watering-place *en route*. An official rural banquet was given at 4.30 p.m. at Almadi, during which there were speeches. At 6.30 p.m. the return journey by steamer to **Siofok** was made, and from there by train at 8.30 p.m. to **Budapest**, which was reached about 11.30 p.m.

Technical Notes.

At the *Almadi* landing stage an *Obligatory Fire Brigade* was in attendance. This comprised some forty able-bodied villagers of good physique, who wore their ordinary working clothes, comprising a kind of corduroy or velveteen jacket suit, with high Blucher boots and soft black hats, each man having a red armlet. The officers and non-commissioned officers wore uniform.

**Obligatory
Rural Fire
Brigade**

With the Meeting of the International Fire Service Council on the preceding day, the Budapest Congress had seen its conclusion, and the excursion to the Balaton Lake took the form of an informal excursion.

Congress

The primary results of the discussions at Budapest are embodied in the following *Congress Resolutions* as translated into English:—

**Congress
Resolu-
tions**

BUDAPESTH CONGRESS RESOLUTIONS.*I. Re MILLS AND FACTORIES.*

The Congress considers:—

1. THAT Mills and Factories should be provided with properly organised private fire brigades to meet the early stages of an emergency, and that these brigades should be officially inspected at regular intervals.
2. THAT any fire or alarm of fire in a Mill or Factory, however slight, should be immediately reported to the local authority with the view of preventing similar occurrences, and that a failure to immediately make such a report should be heavily penalised.
3. THAT the preventive measures against the possible outbreak of fire in Mills and Factories should be increased by a more systematic development of the structural regulations, as also of regulations defining watchmen's duties and responsibilities.

**(Mills and
Factories)**

II. Re THEATRES.

The Congress considers:—

(Theatres)

THAT it is absolutely essential that all stage scenery and properties be rendered non-inflammable in a reliable and permanent manner, and that all the constructional parts of a stage be of a fire-resisting character.

III. Re CHEMISTRY OF FIRE PROTECTION.

The Congress considers:—

**(Chemis-
try)**

THAT the greatest attention should be accorded to the chemistry of fire protection in the interests of fire prevention.

IV. Re FIRE ALARMS.

The Congress considers:—

**(Fire
Alarms)**

THAT the public authorities should accord greater attention to the installation of modern fire-alarm systems in the minor urban and rural districts.

Diary.

Monday, Aug. 22nd.

RETURN JOURNEY—VIENNA.

Breakfast at 6.45 a.m. At 8 a.m. the Commission **left Budapest** in reserved carriages for Vienna, arriving there 12.5 p.m. Lunched on train. *Lieut.-Col. Fox* remained at Budapest.

The Commission was met at the station by officers of the Vienna Fire Brigade with an Electric Motor "Trap," which was kindly placed at the party's disposal by the Brigade for the day. The Commission inspected very carefully the extensive new buildings of the **Retail Stores**, "*Gerngross*," then on point of completion. The party drove out to Schoenbrun Park and visited **Schoenbrun Palace** under guidance, and then drove back to town and visited the **Imperial Museum**. The party then returned to the Fire Brigade Headquarters, "Am Hof," to call on the officers before leaving Vienna, after which the party strolled through the town to the railway station, and dined at a restaurant adjoining the station at 8.30 p.m. Mr. Percy Collins here left the party to visit Würzburg. The afternoon at Vienna was a wet one.

The party boarded a reserved sleeping-car on the 10.10 p.m. train *en route* to Salzburg.

Technical Notes.

The *Motor Trap* was electrically driven, the power being applied to the front wheels. There was no tendency to skid. The vibration was considerable owing to general rough condition of the granite paving. This type of electric Motor Trap will probably be introduced generally in the brigade.

Electric Motor Trap

The chief point aimed at in the *new Vienna Retail Warehouses* or *Stores* in the event of fire is apparently to get the people out. Therefore, in addition to the open stairways in the body of the building, additional fire-resisting staircases are provided, enclosed with brick walls, and the door openings on to these have metal-lined doors closing automatically and opening outwards. They have direct communication with the street, and no part of any floor is more than 60 feet from any one of them. The public are encouraged to use these staircases in going from one floor to the other so as to get to know their location. The windows overlooking adjoining light courts are glazed with Luxfer prisms in metal frames. No subdivision by fire-walls and fire-resisting doors of the very large area occupied has been attempted. The whole building is in one risk. All structural iron work in this building is encased, and its roof is flat and covered with a layer of gravel.

Retail Store Buildings

The arrangement of this building had been to some extent controlled by the Fire Brigade, who require outside iron ladders fixed against walls so as give firemen access to windows on each floor.

At present the *new Stores* communicate with shops belonging to the same firm. It is evidently intended to rebuild these shops and still further increase the size of the new block.

If from any cause, delay should occur in attacking a fire with full strength and ample supply of water at high pressure, the present new building alone would give very great trouble to the Brigade, who would probably be unable to prevent the spread of fire to surrounding properties.

As to the *Disabled Firemen's, Widows' and Orphans' Funds*, in Austria each provincial association manages its affairs independently, as a rule, though it may be assumed that besides the proportion of the funds from the insurance taxation, which is distributed *pro rata* in the different provinces, every fireman, in some way or other, contributes towards the provincial fund in question. In most cases the contribution simply comprises the personal contribution of each fireman, ranging from 2d. to 6d. per annum.

Widows' and Orphans' Funds

Diary.

Tuesday, Aug. 23rd.

SALZBURG.

The Commission **arrived at Salzburg** at 7 a.m. and walked to the *Hôtel Europe* near by, where quarters were reserved. The programme provided for this day was a quiet one to serve as a rest before visiting the German cities. The party strolled through the town and visited the **Salzburg Cathedral**. Luncheon at 1 p.m.

The party in the afternoon went by Cog-wheel railway up to the **Salzburg Castle**, where a very beautiful view was obtained of the mountains and surrounding country, explored the interior of the Castle, and walked from Castle along top of hills to edge of the cliff overlooking the town, whereupon the descent being made by an electric lift. Dinner at 7 p.m. at the Hotel.

At 8 p.m. the Commission received a formal visit from a party of officers of the *Salzburg Fire Brigades' Union* and the *Salzburg Volunteer Brigade* at the Hotel, also visits from the *Town Surveyor* and other officials.

Technical Notes.

The *Salzburg Fire Brigade* has a strength of 257 all ranks, divided into 3 Companies. The Brigade is supported by voluntary contributions, the Corporation giving about £400 per annum. The Corporation also provides the Fire Stations rent free.

In the *Salzburg F.B. "Company"* drill on the following day, the most interesting feature was the drill with two 80-feet long ladders, of different makes (both South German), which were each worked by one Foreman and four men of approximately equal physique and smartness. The one ladder, although the heavier, was worked the quicker. On both these ladders hose was lifted with the raising of the ladder, but there was a tendency for the hose to foul, and although no fouling occurred, the possibility of such a hitch detracted from the advantages of this method of raising hose.

The *Hook Ladder Drill* with circular headed hook ladders, by four men of the Company, selected indiscriminately, was very smart. The "turn out" and wet drill with the two mechanical long ladders, a hose reel, and a manual engine, was carried out in a very business-like way, the men very obviously working particularly steadily—if anything rather slowly—to avoid hitches.

From the time of sounding the alarm to water being given from the top of the two 80-feet long ladders which had been adjusted and applied to buildings, the roadway being on a gradient, was 4 mins. 25 secs.

A certain number of men are trained in ambulance work, and form a special *First Aid Section* under a doctor. There is also a *Flood Service Section* of 37 men.

The brigade provides a *Theatre Watch* of an evening at the Municipal Theatre for the duration of the performance.

The Brigade's Benevolent Fund has a capital of about £4,000, due entirely to voluntary subscriptions.

Salzburg is well supplied with water for fire purposes, the whole being collected from the mountains, and distributed from the Municipal Water Works. The diameter of the mains varies from 0·08 m. to 0·30 m. *Salzburg* is provided with 297 Hydrants at a distance of about 300 feet apart, with a pressure from 5 to 7 atmospheres. At one large fire some little time ago 14 deliveries were used off 7 adjoining Hydrants. Manual or Steam Engines are apparently never used within the city boundaries. The branches brought into play at the wet-drill were very effective ones.

Chief Officer of the Salzburg F.B.: K. Reitsamer.

Town Surveyor, Salzburg: Müller.

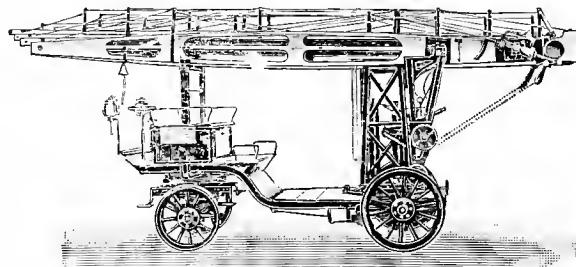


Fig. 28.—NUREMBERG FIRE BRIGADE 80 FEET MECHANICAL LONG LADDER.

Volunteer
Fire
Brigade

Mechan-
ical Long
Ladders

Pompier
Ladders

Turn Out

Theatre
Watches

Benevo-
lent Fund

Water

Diary.

Wednesday, Aug. 24th.

SALZBURG AND MUNICH.

Breakfast at 7.30 a.m. The Commission was driven in carriages provided by the Chief Officer of the Salzburg Volunteer Fire Brigade at 9 a.m. to witness a "Company" drill and display at one of the **Salzburg Fire Brigade Stations.** Light Luncheon at the Hotel.

The party **left Salzburg** in reserved carriages by 12 (noon) train for Munich, **arriving at Munich (Bavaria)**, at 3.20 p.m. The party drove to the *Vier Jahreszeiten Hotel*, where quarters had been reserved. Early dinner at Hotel.

Professor Littman met the Commission at the Hotel at 5 p.m. and drove them to the **Prince Regent's Opera House**, of which he is the Architect. The Commission inspected the Theatre and the stage fittings and appliances, over which last named they were shown by the Engineer-in-Chief. Seats in the auditorium were provided by Professor Littman, and the Commission witnessed the last two acts of **Wagner's Opera, "Tristan and Isolde,"** adjourning between the acts to the Foyer and garden attached, where the Commission were met by the *City Surveyor*, who also holds office as Chief of the Fire Brigade.

At the conclusion of the Opera, the Commission drove to *Villa Littman* to supper at the invitation of Professor Littman to meet a party of his friends. Returned to the Hotel about 1 a.m.

Technical Notes.

Bavaria had six million inhabitants in 1901 and covered some 29,000 square miles. The kingdom of Bavaria has some 7,300 parishes and holds the unique position that of these parishes, no less than 6,744 have *Volunteer Brigades*. There are no less than 7,290 Volunteer brigades, but several parishes have more than one Brigade. The Brigades have altogether about 385,000 Firemen, all ranks.

The Volunteer Fire Brigades are grouped into 186 *Bavarian District Associations*. The 186 District Associations are formed into 7 *Bavarian Provincial Associations*, and these 7 Provincial Associations comprise the *Bavarian Fire Brigades' Union*.

The Fire Service in Bavaria plays a most important part in all local affairs, and is eminently popular.

The Brigades are well equipped with modern appliances. They have the advantage of receiving monetary assistance from the *State Fire Insurance Institution*, not only in respect to their equipment, but also in respect to their benevolent funds. These *Benevolent Funds* are exceedingly well organised, and pay away considerable sums annually to disabled Firemen, widows and orphans.

Bavaria has its standard coupling and connecting piece, and its standard manual engine. It has a very comprehensive literature.

There are but few *Professional Brigades*, in our sense, in Bavaria. They are the exceptions, and are looked upon more as supplementary to the volunteer brigades, i.e., as constituting a kind of permanent watch working in conjunction with the volunteer service.

There is no state in Europe where the fire service receives so much appreciation from the public authorities as in Bavaria.

The Regent Theatre at Munich cannot be considered a Theatre in the ordinary sense, inasmuch as it is essentially an Amphitheatre on the Bayreuth principle, intended for the presentation of Grand Opera, and the circumstances of its erection were peculiar.

From the fire point of view the amphitheatre tends itself particularly well to the safeguards of rapid exit for the public into large anterooms, and from there on to the public thoroughfares. Thus the *facilities of exit* were remarkable. The audience provided for, however, is small compared to the superficial area of the building, for there are only 1,028 seats in the "Amphitheatre," i.e., Stalls, and with the boxes at the back the total is only 1,100. The 1,028 "Stalls" empty to the right and left through six pairs of wide double doorways, about four to five rows of stalls to each pair of doorways. Only the public using the back two doorways have to pass over a staircase to reach the ground floor level.

The architectural rendering of this building both of the exterior and the interior is satisfactory, for a building of its kind, and the colour study of the interior, particularly calls for attention.

There are fire-resisting curtains to the proscenium opening, and between the main stage and the rear stage. These curtains can be worked both from the stage and from the corridors outside the stage.

The hydrant system is a considerable one. The Sprinkler system on the Drencher principle has been installed over the entire stage, and can be worked by sections or in its entirety.

The stage is a modern one of metallic construction.

There is a large Restaurant in connection with the Theatre.

National Fire Service

National Fire Brigades' Union

State Fire Insurance Benevolent Funds

Standard Couplings

Theatre

Theatre Exits

Theatre Fire Curtains

Theatre Sprinkler

Diary.

Thursday, Aug. 25th.

MUNICH.

Breakfast at 8.45 a.m., and at 9.30 a.m. visited the **Munich Fire Brigade Headquarters**, over which are situated the offices of the Municipal Building Control and Fire Survey Department. The whole working of the fire survey system was explained in detail by the City Surveyor, who also has charge of the Fire Brigade. The Fire Brigade quarters and stores were inspected, after which the Brigade was "turned-out."

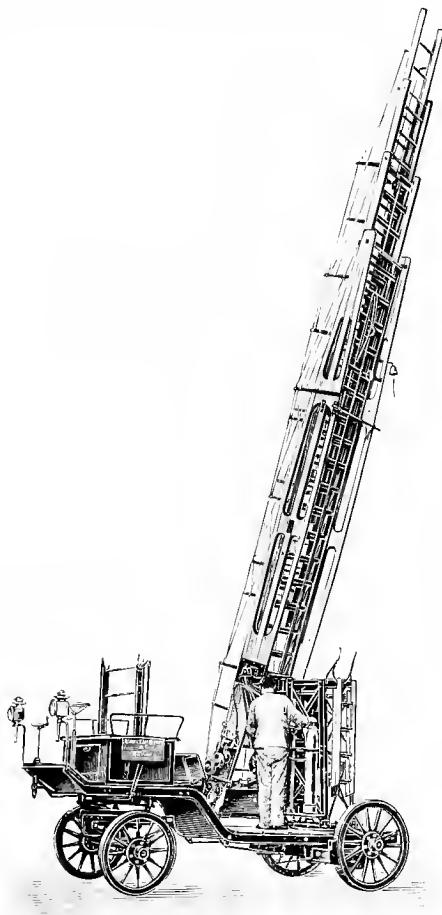


Fig. 20.—NUREMBERG FIRE BRIGADE 80 FT.
MECHANICAL LONG LADDER.

Technical Notes.

The head offices of the *Munich Municipal Building Control and Fire Survey Departments* occupy the second and third floor of the block which contains the *Fire Brigade Headquarters*. The offices are roomy and most complete in their arrangement and equipment.

Plans for all buildings in Munich have to be approved by this Department. The building owner may appeal to the Bavarian Home Office if he has a grievance, and, finally, he may also appeal to the Minister of Interior personally if not fully satisfied.

The principal officers of the Fire Brigade have to pass qualifying examinations in building construction.

There is an elaborate code of building regulations in Munich, but many of these regulations only lay down guiding principles, leaving the officials considerable discretionary powers.

The Munich regulations allow the officials of the Building Control and Fire Survey Departments to enter any building at will, and make requisitions for further safety from fire both from the building point of view and that of their general management, against which requisitions there is a power of appeal as described above. Chimneys are compelled to be swept periodically by public chimney-sweeps at a tariff charge, and the chimney-sweep is held responsible if a chimney in his district remains unswept. An inquest is held on fires if thought necessary, irrespective as to whether there has been loss of life or not. Dangerous structures are dealt with promptly by a trap fitted with appliances and materials being always ready for horsing and despatch from the station, like an ordinary fire brigade appliance.

The *Munich Fire Service* comprises a combination of professional and volunteer fire service.

The *Munich Professional Brigade* has a headquarters and 4 substations. It comprises 3 Officers, 2 Warrant Officers, 16 Foremen, and 148 Firemen, under direct orders of the Surveyor who is Chief Officer of the combined professional and volunteer forces.

The *Munich Volunteer Brigade* has generally a strength of about 825 men, all ranks, divided into 11 sections, each of which has its own fire station and drill yard. Each section has a trap with a 60 ft. extension ladder and a manual engine; five of the sections, however, also having additional 80 ft. mechanical long ladders. The Volunteer Fire Brigade plays a very important rôle in the civic life of the community, which comprises about 520,000 inhabitants, with some 23,000 buildings.

There are further two additional *Suburban Fire Brigades*, specially attached to Suburbs and individually constituted, who, however, work under the general system of the Munich Fire Service.

The additional brigades referred to from the outer suburbs have respectively 58, and 45 men, all ranks.

As it is anticipated that the Volunteer Firemen are generally away from home on Sundays, each Volunteer section has to provide a "Sunday Firewatch" of one foreman and 6 men at the sectional station for the entire Sunday. The Volunteer Brigade has two additional *Ambulance Sections*.

The Municipality pays for the appliances, horses, telephones,

Building
Control
Fire
Survey
and Fire
Service
Depart-
ment

Building
Control

Combined
Profes-
sional and
Volunteer
Fire
Service
Profes-
sional
Fire
Brigade
Volunteer
Fire
Brigade

Suburban
Volunteer
Fire
Brigade

Diary.

Thursday, Aug. 25th.

MUNICH.

The Commission then went over the **Spaten Brewery** and warehouses, and also inspected the scene of a recent fire at a **Railway Carriage Works.**

Luncheon at 1 p.m. at the Hotel, when *Professor Littman* and several of his friends were the Commission's guests.

Technical Notes.

telegraph, fire stations, and their upkeep of the Volunteer Brigade, **Fire Call**, but the latter pays for its own uniforms, kit, minor gear, and the general expenses of the corps.

The sections of the Volunteer Brigade turn out only in their own districts as a rule, but turn out for other districts when specially ordered. When there is a Brigade "Call," which Brigade call is *ipso facto* for fires at theatres and several of the large public buildings, the Volunteer Brigade attends.

The Brigade has 324 fire-call points, which number is now being increased. There is also a permanent fire-watch for showing lights on the steeples of several churches.

In the "turn out" at Munich, 4 machines with 32 men turned **Turn Out** out, horsed complete, in 38 seconds from the sounding of the alarm, most of the men being on the first floor, and the coachmen in their rooms near the stables.

The Bavarian horses at Munich (which come from the hills) were generally considered to be by far and away the best seen on the journey.

The Professional Fire Brigade provides the necessary **Fire Watches** at the various theatres during the performance. The two Royal Theatres, besides this, are provided with a permanent watch from the Brigade.

Fire Brigade Horses

Theatre Watch

The **Spaten Brewery** and **Warehouses** did not accord with modern **Brewery** requirements from the fire point of view.

The **Railway Carriage Works**, which had been the scene of the fire, in no way accorded with modern requirements from the fire point of view, and the amount of sawdust and shavings left about did not speak well for the management.

Railway Carriage Works

There does not appear to be any defined limit as to *Cubical Contents of Buildings at Munich*. The one for Messrs. Emden visited contained 2,800,000 cubic feet, and the other about 3,200,000 cubic feet.

Retail Store Buildings

Ample stair accommodation similar to Vienna has to be provided, and the ironwork has to be protected, and the floors have to be fire-resisting throughout. The planning was excellent from the point of view of exits. The basement was very cleverly separated from the floors above without materially complicating the possibility of rapid access.

Water

The **Munich Water Supply** appeared very satisfactory for fire purposes. It is collected from the mountains, and is distributed from the Municipal Water Works with a pressure from 4 to 5 atmospheres in all parts of the city. The Commission did not see a wet-drill off hydrants, but at the Railway Carriage Works fire, although 24 jets of water were used, 4 only were delivered from (2) steamers, the rest being taken from private yard and street hydrants, which speaks highly for the supply.

*Architect of the Regent Theatre and the two Retail Stores : Littmann.
Engineer in Chief of the Regent Theatre : Klein.
City Surveyor and Chief Officer of the F.B.'s : Niedermayer.*

In the afternoon inspected **Messrs. Emden's Retail Warehouse** of large cubical extent in course of erection, and another building of still larger dimensions constructed on a Ferro-Concrete system to serve as **Messrs. Tietz' Retail Warehouse**. The buildings were carefully shown and explained by *Professor Littman*, the architect, whose working drawings were also exhibited. Subsequently the party visited the **Villa Lembach** Picture Gallery and the Central Hall of the **Law Courts**, and Mr. Sachs left cards on behalf of the Commission on the *British Consul-General*. Dinner at the Hotel at 7 p.m. It rained heavily all day. The party spent a quiet evening.

Diary.

Technical Notes.

Friday, Aug. 26th.

NUREMBERG.

Breakfast at 6.30 a.m. The Commission **left Munich** at 8 a.m. for Nuremberg. Its luggage was booked through to Frankfort.

The Commission **arrived at Nuremberg** at 10.49 a.m. The Commission was met at the Railway Station by the *Mayor's deputy*, the *Chief of the Fire Brigade*, and the *British Vice-Consul*. The Mayor's deputy formally welcomed the Commission and put Municipal Carriages at its disposal.

The Commission then drove to the new **Municipal Theatre** in course of construction, from designs of the Architect, *Herr Seeling*, of Berlin, which was carefully inspected. All details were explained by Architect's representative, and the working drawings and models were exhibited. Afterwards the Commission visited the **Municipal Museum**. At 12.15 p.m. the Commission visited the **Nuremberg Fire Brigade Head Quarters** in course of reconstruction, the plans and details of which were explained by the Chief. The party then drove through the historical part of the city to the **Rathaus**, where luncheon was served in the old **Rathaus-Keller** at 1 p.m., at the invitation of the *Mayor*. The *Mayor* received the party and bade them welcome.

The British Vice-Consul: Mr. S. Ehrenbacher.

The Chief Officer of the Nuremberg F. B.: F. Wolfermann (Iron Cross).

The new *Nuremberg Municipal Theatre* has all structural ironwork **Theatre** protected by a thick coating of plaster on wire lathing.

The *Nuremberg Fire Service* stands as the most economically organised efficient Fire Service in Central Europe, and its form of organisation, it should be added, is peculiar and exceptional. The entire Fire Service cost the city in 1902, 120,000 marks, *i.e.*, £6,300. The total of inhabitants in 1900, was 261,000.

The service Nuremberg has for this small amount of money is a highly-trained *Retained Fire Brigade* of 150 men, and *Two Volunteer Fire Brigades* of 130 and 224 men respectively. Further, it has an auxiliary of eighteen *Suburban Volunteer Fire Brigades* (1,080 men) and two *Private Factory Fire Brigades* (71 men). The whole service stands under a professional chief officer and professional second officer. There are 8 Telegraph Clerks, 6 Watchmen and 17 Coachmen attached to the Retained Brigade.

The service has been in existence for 50 years. It has gradually developed and has worked remarkably well, and may, in fact, be taken as a model institution for Municipal economy, with due regard to up-to-dateness and efficiency.

The *Retained Fire Brigade* comprises entirely, Municipal employees, regularly engaged in the Municipal workshops, scavenging and works department. The Municipal workshops are located alongside the Fire Brigade Stations.

There is a Headquarters Station for the *Retained Brigade* and *Volunteer Brigade* in the centre of the town, a modern District Station in the Western district, and a third District Station is in course of erection for the Eastern District, which is at present only served by a small Branch Station.

At Headquarters Station there are on immediate duty by day, 14 Firemen (chiefly Smiths and Carpenters) of the Retained Brigade. Nine men of the Retained Brigade are on duty at Headquarters at night, together with 8 men of the Volunteer Fire Brigade.

At the West District Station, 14 men of the Retained Brigade are on duty by day, and the same number at night.

Regarding the equipment, the following are some notes:—

The Headquarters can turn out in succession, four complete units of the following strength, namely:—

First unit, a large chemical engine, and a mechanical long ladder.

Second unit, a trap with hose reel, a special gear cart, and a long ladder.

Third unit, a trap with hose cart and manual, and a long ladder.

Fourth unit, a steam fire engine, and hose and coal tender trap.

From the West District Station three units can be turned out in rotation, namely:—

First unit, large chemical engine, large trap, and a long ladder.

Second unit, a trap with hose reel and manual engine.

Third unit, a steam fire engine and a hose tender and coal tender trap.

The equipment of the Eastern Sub-station at present comprises a turn-out of a trap and a long ladder.

The Brigade can thus turn out immediately, in rapid succession, these horsed appliances, well organised and fully manned. It further has a reserve of 4 manual engines and 2 long ladders.

Combined
Retained
and
Volunteer
Fire
Service

Volunteer
Fire
Brigade

Retained
Fire
Brigade

Fire
Brigade
Equip-
ment

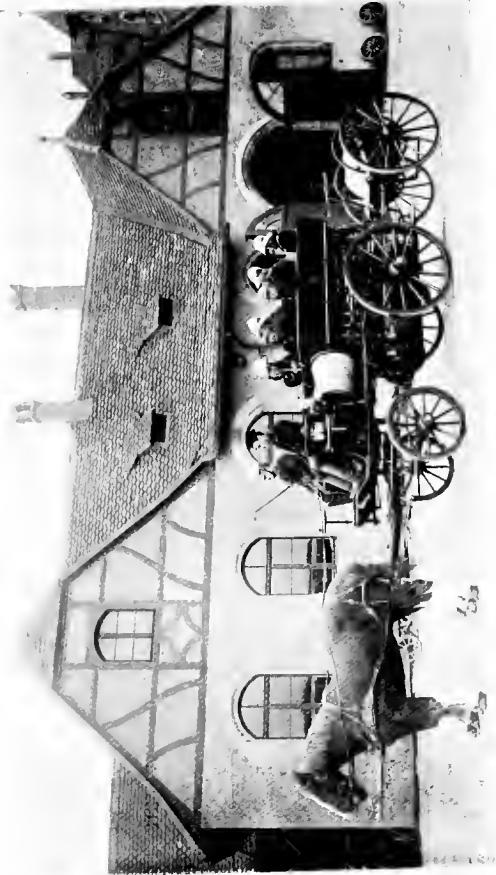


FIG. 31.—NUREMBERG RETAINED FIRE BRIGADE. CHEMICAL ENGINE WITH HOSE REEL PROCEEDING TO A FIRE.

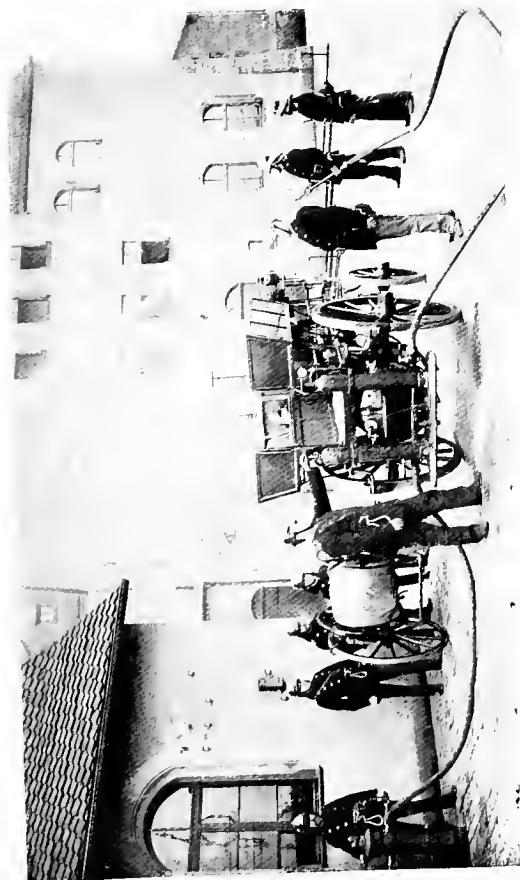


FIG. 30.—NUREMBERG RETAINED FIRE BRIGADE. CHEMICAL ENGINE IN OPERATION.

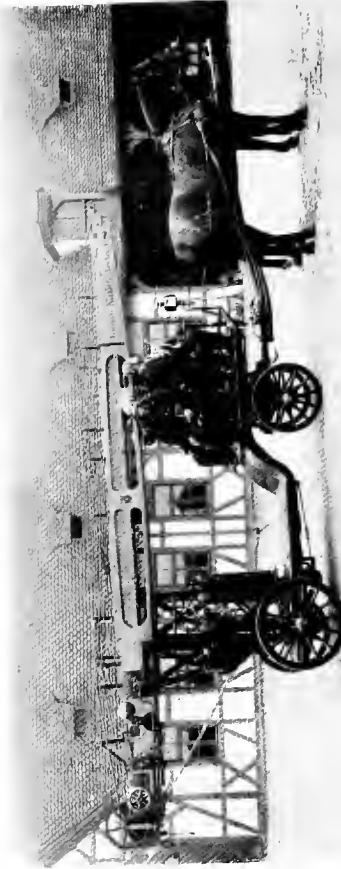


FIG. 33.—NUREMBERG RETAINED FIRE BRIGADE. 80 FEET MECHANICAL LONG LADDER PROCEEDING TO A FIRE.

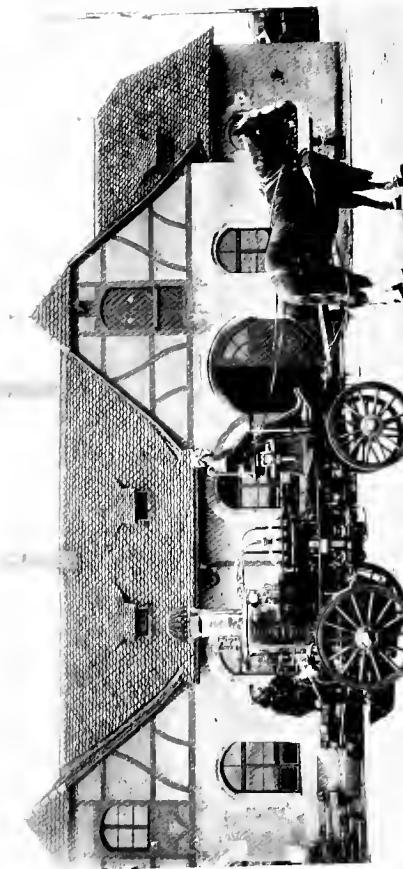
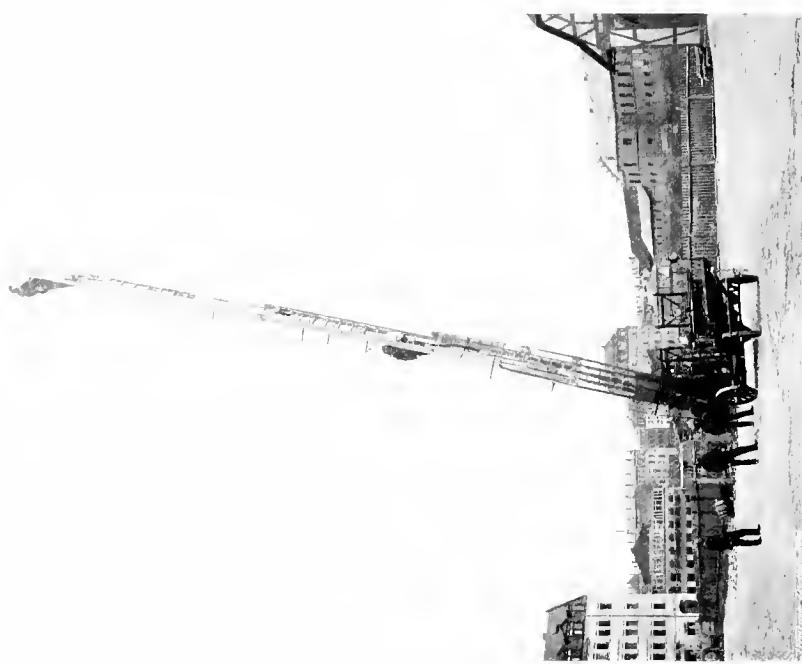
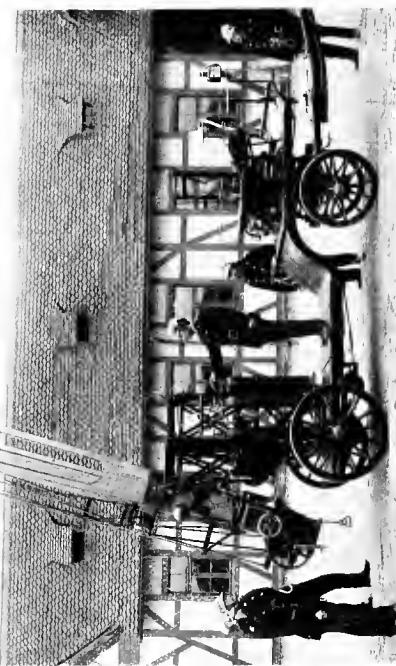


FIG. 32.—NUREMBERG RETAINED FIRE BRIGADE. STEAM FIRE ENGINE.



FIGS. 34 and 35.—THE NUERMBERG RETAINED FIRE BRIGADE. MECHANICALLY WORKED SO FEET LONG LADDERS.

Diary.

Friday, Aug. 26th.

NUREMBERG.

Technical Notes.

The *Suburban Volunteer Brigades* have besides at their disposal, 25 manual engines, 9 fire escapes, and 18 hose reels.

The whole of the hose for all Brigades is of uniform pattern and make, with bayonet pattern standard couplings.

The Brigade posts an evening "fire watch" at the Theatres.

The men of the Retained Brigade get modest extra pay for Fire Brigade duty, but this pay is intended rather to cover disbursements or expenses than to be considered as wages.

The Brigade uses the Municipal horses, all of which are stabled in proximity to the Fire Stations, and a number of which are kept on duty for Fire Brigade purposes in the actual stations.

For all practical purposes the Retained Brigade is the professional brigade in which the men do Municipal work in the Municipal workshops, and elsewhere, *i.e.*, in training, drill, and general efficiency they are quite up to the best professional standard.

The Volunteer Brigade is well drilled, and includes the best of the younger townsmen, who do duty at night by rotation. The brigade's responsibilities are clearly defined, and the position of the professional chief and second officer clearly laid down by bye-laws.

There are 129 *Fire-call Points*.

During the 50 years' existence of the Service, 85 Firemen received the 25 years' long service, medal, of whom 32 belonged to the Suburban Volunteer Brigades.

Theatre Watch
Retained Fire Brigade Pay Horses

Volunteer Fire Brigade Night Duty Fire Call

Turn Out

At the "turn out" the *Nuremberg District Fire Station* turned out in 42 seconds with one chemical engine, one large gear and hose trap, and one 75-feet mechanical long ladder, the majority of the men at the time of the call working at their respective trades in the *Workshops off the Station yard*, which was about 100 feet sprint to the doors of the Engine House.

There was a very smart wet drill with one chemical engine and one jet, the chemical engine first doing its work independently and then taking up water from a hydrant in the yard. The pressure in the hydrant was about four atmospheres, and the stream went well over an 88-feet tower, the branch being run up to the top of a long ladder and lifted about 60 feet above street level.

A heavy steam fire engine was seen which has been presented by an Insurance Company. It had 1,500 gallons capacity, and 28 h.p., but apparently could not be relied upon for continuous work.

The high efficiency of the individual fireman, not only as a fireman, but also at his actual respective trade, was particularly noticed, and this whole system of the men of municipal workshops being employed as firemen was considered to be the most economical arrangement seen on the journey, for medium-sized towns.

A proportion of the men are trained for ambulance work.

Water

At *Nuremberg* the Municipal Water Works get their water from the hills, and provide all Hydrants at a pressure of 4 to 5 atmospheres. Hydrants are placed fairly close, 1,833 being in use—1,055 are Standard and 778 underground in Hydrant Boxes. When frost sets in, 6 men are employed in attending to Hydrants by protecting them, etc., from the weather, and a water-cart, holding about 500 galls. of water, also turns out with the first engine. At the display given two good jets were delivered from top of Escape (75 feet high) from one Hydrant.

At a recent fire fourteen jets were worked off six hydrants.

In the afternoon, the newly erected ***Nuremberg District Fire Station*** was visited and inspected, after which the brigade "turned out." A photograph of the party was taken. The party was then driven through the historical parts of the town, viewed the ***City Walls*** and other objects of interest, also inspected the new ***Lezykauf Retail Stores***.

The Commission ***left Nuremberg*** at 6 p.m., and ***arrived at Frankfort*** at 11.15 p.m.. The party drove to the *Frankfurter Hof*, where quarters had been reserved and where the Commission was met by the *British Vice-Consul*.

Diary.

Saturday, Aug. 27th.

FRANKFORT A/M.

Breakfast at 7.30 a.m. The Commission was met by the *British Vice-Consul* and driven in Municipal Carriages, put at their disposal, at 8.45 a.m. to the new **Frankfort West End District Fire Station** in the Henrich Strasse, which was inspected and the Brigade "turned out." The Commission was received by various representatives of the Municipality, the *Chief Officer of the Brigade*, and by *Herr Rentlinger* and an Interpreter.

Next, the Commission carefully inspected the new **Municipal Theatre**, built from the designs of *Herr Seeling*, many technical details of which were explained by the engineers in attendance. From thence the party drove to **Messrs. Schmollers's Retail Store** at the corner of Zeil and Schäfergrasse, and after inspecting the premises and constructional details were entertained by the owners at Luncheon. After Luncheon the Commission visited the **Town Hall**, whereupon they returned to the Hotel where the party was photographed in the courtyard.

The afternoon was spent quietly in strolling around the city. The "**Palmgarten**" was visited. Dinner at the Palmgarten.

Technical Notes.

The British Vice-Consul: *Mr. Schwarz*.

Alderman: *Stadtrath Ernst Lautenschlager*.

City Surveyor: *G. Gregorov*.

Chief Officer of the Frankfort F.B.: *Schäfer*.

The Frankfort Professional Fire Brigade in 1902 had a strength of 168, comprising a Chief Officer, a second Officer, a Store-keeper, 4 Warrant Officers, 25 foremen, and a staff of 128 Firemen, and 6 Telegraph Clerks. They were stationed at three stations of which the West End Station is the most modern. The figures of 1902 have been slightly increased since then.

An analysis of the former trades of the firemen is of interest:—

Thirty-five were in the building trade, 37 were mechanics, 14 were cabinet makers, 37 were labourers, 22 were shoemakers, tailors, and saddlers, 6 were musicians, and 12 were coachmen. The shoemakers, tailors, and saddlers are required for the repairs of the Brigade, and the musicians act as Orderlies and Signallers.

The town has about 400 fires per annum, of which some two-thirds involve the calling out of the Brigade.

The Brigade provides permanent "fire-watches" in the two Municipal Theatres. These watches are strengthened of an evening and watches are also provided during the performance at other theatres.

The Brigade has an auxiliary service of four *Suburban Volunteer Fire Brigades*, of which one has 52 all ranks, and turns out annually to about 20 fires. The three others have 42, 45, and 26 men respectively all ranks. The Volunteer Brigades between them have 4 mechanical long ladders. They each have one manual, but mainly work with hydrants and hose carts.

At the "turn out" of the *Frankfort Fire Brigade* four appliances moved off in 40 seconds from the time the alarm.

The above ground hydrants were examined and demonstrated.

A proportion of the men are trained for ambulance work.

The *Automatic Fire Calls* at the new *Frankfort Theatre* are a special feature, 300 thermostats ringing into a guard-room near the stage door, and during a performance these alarms are switched on to the nearest Fire Brigade Station. Two false alarms from thermostats were recorded last year, due to vibration. This has now been guarded against. There are also ordinary call points.

There is a Sprinkler installation on a dry pipe system. Hydraulic power is used for working the Fire-resisting Curtain. All scenery has to be treated to prevent it carrying flame. Slip hooks are provided for releasing scenery. A very efficient system of stage ventilation forms a special feature.

The retail warehouse of *Messrs. Schmoller* is an extensive department store, open to roof, with gallery round and with iron construction unprotected. It had several Fire-call points.

At *Frankfort*, the *water* is from the hills, but the pressure in the mains appears to be very unreliable for fire purposes, four atmospheres being the highest that can be registered, whilst in some parts of the town the pressure is apparently almost "nil." Therefore the Brigade is always obliged to "turn out" with their Chemical and Steam Engines. There are 1,500 Hydrants, nearly all being Standards (after same pattern as Nuremberg). These are placed between 350 and 450 yards apart. In the display off a hydrant the jet was poor.

Combined Professional and Volunteer Fire Service

Professional Fire Brigade

Theatre Watch

Suburban Volunteer Fire Brigade

Turn Out

Theatre Theatre Thermometers

Theatre Sprinklers

Retail Store Buildings

Water

Diary.

Technical Notes.

Sunday, Aug. 28th.

THE RHINE.

Breakfast at 7 a.m. The Commission **left Frankfort** at 8.10 a.m. in order to have a quiet day on the **Rhine**. The luggage was booked through to Cologne. The party took train to **Biebrich**, arriving at 9.14 a.m., walked to the **Biebrich Rhine Pier** and took steamer down the river to **Coblenz**. Luncheon on board at 12 (noon). The party landed at **Coblenz**, and inspected the **Monument to Emperor William I.** at the junction of the Rhine and Moselle, strolled through Coblenz to the Railway Station, and took the 4.13 p.m. train for **Cologne**, which was reached about 6 p.m. The party walked to the *Dom Hotel* where quarters were reserved. The party was met at the Hotel by the *British Consul*. Dinner at the Hotel at 7.30 p.m. There was an alarm of fire at Deutz, on the other side of the Rhine, which was attended by the Cologne Brigade.

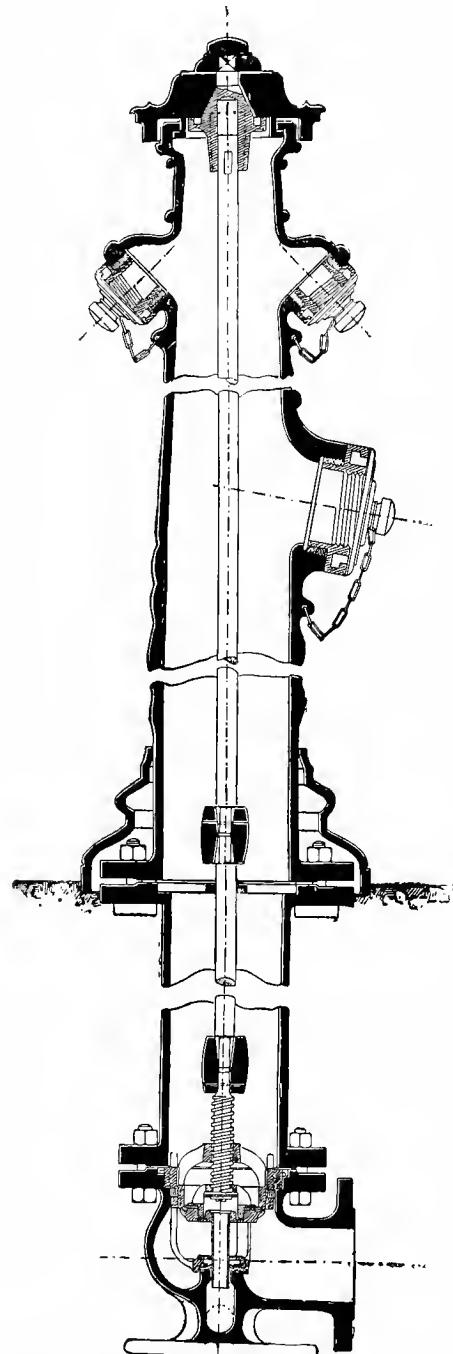


Fig. 36.—HYDRANT STANDARD. TYPICAL SECTION OF HYDRANT STANDARDS IN SOUTH GERMANY

Diary.

Technical Notes.

Monday, Aug. 29th.

COLOGNE,
AND RETURN JOURNEY.

Breakfast at 7.45 a.m. The *British Consul* met the Commission at the Hotel at 8.15 a.m., and a visit was paid to the Town Hall, where the party was received by the *Deputy Mayor* and the *Chief Officer of the Brigade*. Municipal carriages were provided, and the Commission drove through the town, passed the new **Market Hall** in course of construction, to a new **District Fire Station**. The Station was inspected in detail, and the Brigade "turned out."

*The British Consul: Mr. C. A. Niessen, C.I.O.**The Chief Officer of the Cologne F.B.: Schoebel.*

The *Cologne Professional Fire Brigade* is 153 strong, with a Chief Officer, a second Officer, and two Divisional Officers, a Warrant Officer, a Telegraph Superintendent, and 16 foremen. The Brigade has 26 horses, of which 2, however, are used for Ambulance purposes. The Brigade has three large stations and a minor station, and has a permanent fire-watch at the 2 Municipal Theatres. Men are told off for duty as Coachmen among the Firemen. The staff do 48 hours of duty to 24 hours of rest.

Professional Fire Brigade

A peculiarity of the Cologne organisation is its *Auxiliary Retained Fire Brigade* in two sections, comprising a Superintendent, 2 deputy Superintendents, 5 foremen, and 51 men, with 2 horses, who are retained men housed in Municipal buildings (tenements), and available as an immediate reserve force. The first section of the reserve force are housed centrally.

Auxiliary Retained Fire Brigade

There is a further system of *Suburban Volunteer Fire Brigades* manned by Volunteers but equipped by the Municipality and horsed from the Municipal stables or Municipal tramways. Three of these Volunteer Brigades, which have large suburban districts, comprise each a Superintendent, 2 senior foremen and 3 junior foremen, with 50 firemen and 3 coachmen. The minor outlying suburbs have several such Brigades, each having one senior foreman, 3 junior foreman, 20 firemen and 2 coachmen. The combined force of the Suburban Volunteer Brigades is 295, all ranks.

Suburban Volunteer Fire Brigade

The *Cologne Fire Service* thus comprises a combination of a Professional Brigade with a Retained *Auxiliary Brigade* and a system of Suburban Volunteer Brigades.

Combined Professional Retained and Volunteer Fire Service

Of the 3 stations, the central one is still an old building, and the other two are in modern buildings; the extra substation (near the river stores) is also a modern building.

Theatre Watch

The Brigade has about 150 fires to attend per annum. Its printed matter, in the form of an Annual detailed Report, is exceptionally well prepared.

The Brigade does permanent "fire-watch" duty, at the Municipal Theatres, which are strengthened of an evening. It provides additional watches during performances at all other Theatres and public entertainments. Such duties are provided in part by an Auxiliary Brigade and partly by the Professional Brigade.

A number of the Professional Brigade are always utilised for doing general work in the workshops of the Brigade.

The first or central section of the Auxiliary Brigade drills 11 times per annum, and is additionally turned out 11 times per annum (without drill). Men newly attached to the auxiliary force have to go through a four weeks' recruit drill.

Motor Steamer and Motor Long Ladder Fire Call

The Brigade is at present trying a motor steamer and a motor mechanical 80 ft. long ladder. The equipment of the Brigade generally is thoroughly modern.

The town has 77 public fire-call points and 14 private fire-call points. Besides this the new Municipal Theatre has 60 call points.

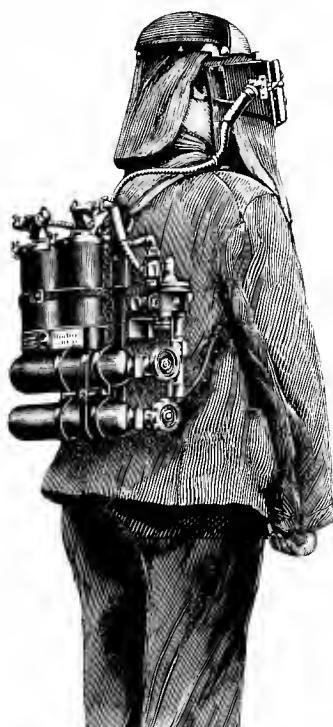
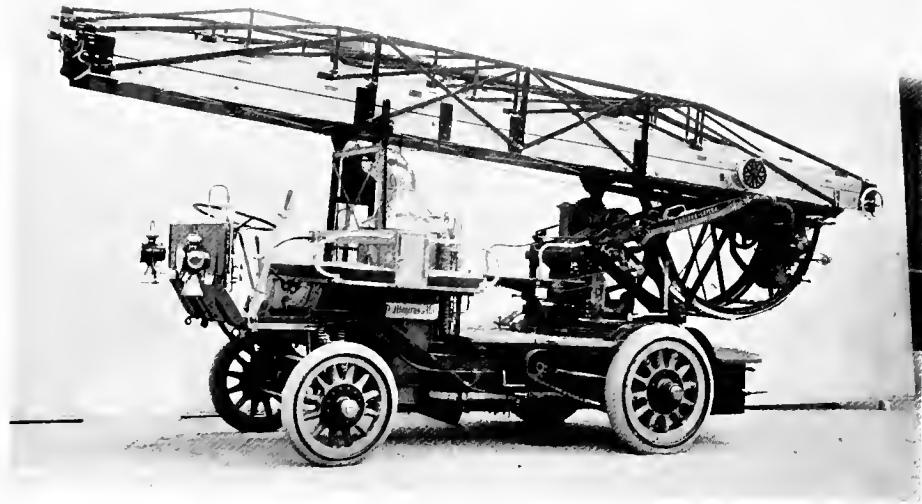


Fig. 37.—OXYGEN SMOKE HELMETS,
TYPICAL PATTERN USED IN
GERMANY.



*Fig. 38.—COLOGNE CITY FIRE BRIGADE.
SELF-PROPELLED, MECHANICALLY WORKED 80 FEET LONG LADDER.*

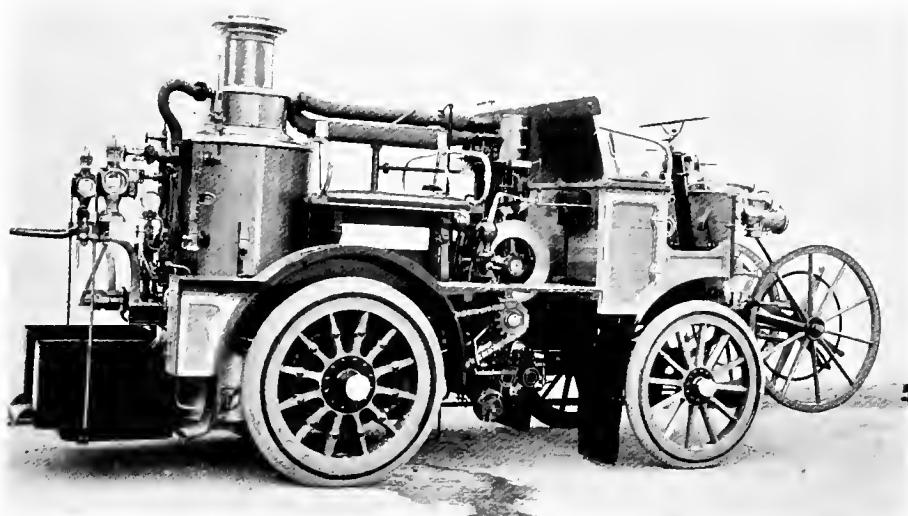
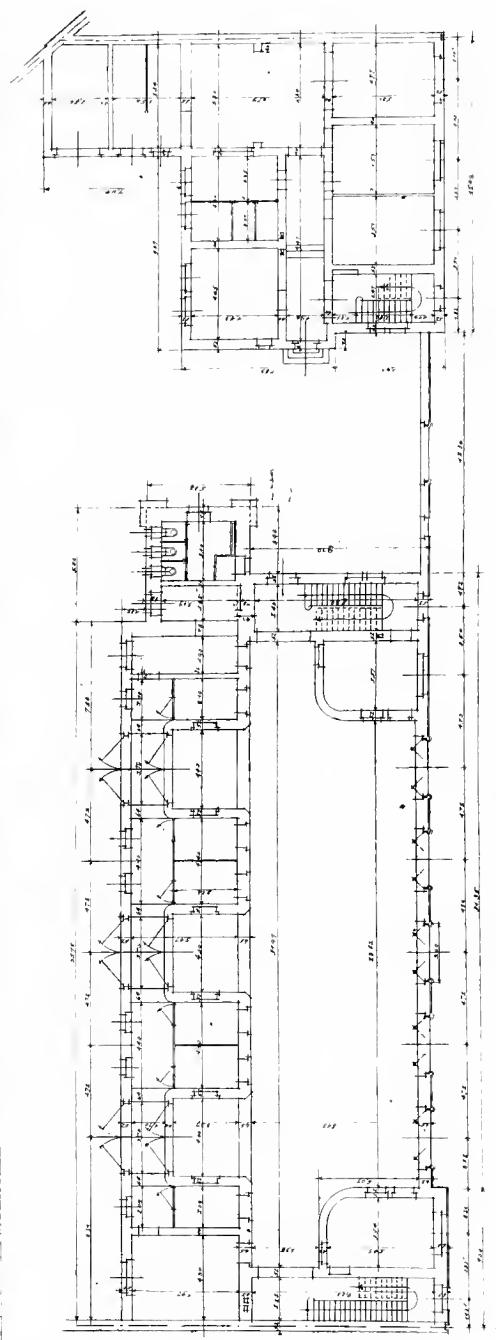
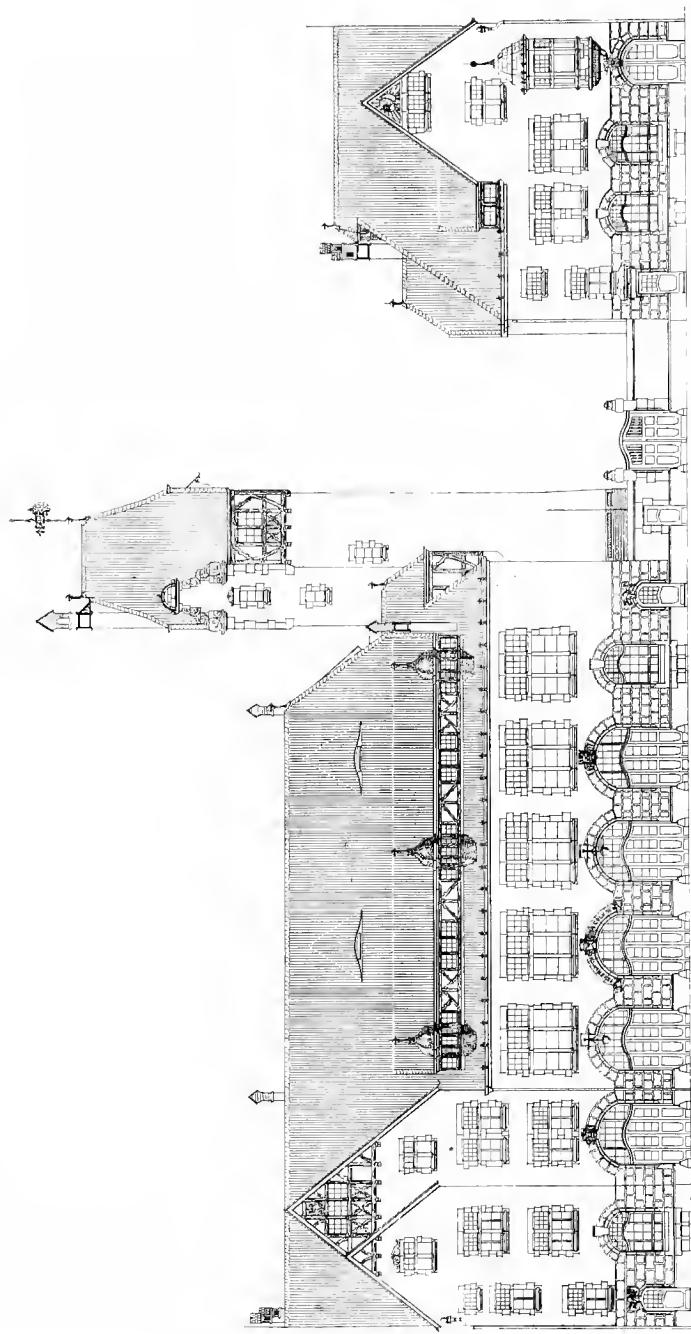


Fig. 39.—COLOGNE CITY FIRE BRIGADE. SELF-PROPELLED STEAM FIRE ENGINE.



FIGS. 40 and 41.—COLOGNE FIRE BRIGADE. THE NEW DISTRICT FIRE STATION (ELEVATION AND PLAN).

*Diary.***Monday, Aug. 29th.**COLOGNE
AND RETURN JOURNEY.

The party next visited the extensive premises of **Messrs. Tietz**, **Retail Stores**. The new **Municipal Theatre** was next visited, where a light Luncheon was provided by the Municipality in the Foyer. The building was afterwards examined under the guidance of the Architect, who also exhibited the working drawings.

The Commission were subsequently driven round the city, after which they were entertained at Luncheon at 2 p.m., at the invitation of the *British Consul* at the *Hôtel du Nord*.

The party **left Cologne** at 5.56 p.m. in reserved carriages *via* Brussels and Ostend for London. Cabins had been reserved on board. Smooth passage.

The Members of the Commission arrived at **Charing Cross Station, London**, at 6.0 a.m., Tuesday, August 30th, where they separated.

Technical Notes.

The general *Civil Ambulance Section* of the Brigade last year turned out 3,700 times. In 294 cases it had to deal with infectious cases. This is radically wrong for a Fire Brigade Ambulance Section.

Fire
Brigade
Civil Am-
bulance
Section
Turn Out

At the "turn out" of the *Cologne Fire Brigade*, one steamer, one Chemic, one trap with men, and one Magirus ladder with 80 feet long ladder, turned out in 37 seconds from the alarm.

Retail
Store
Building

A proportion of the men are trained for ambulance work. The Tietz Retail Stores are of great cubical extent (about 2,000,000 cubic feet).

The block is divided into two by fire wall with iron doors. All doors close at the same instant by operating electric switch.

The enclosed escape stairs are arranged so that no part of the different floors is more than 20 m. from an escape stair.

Theatre

There is no limit as to *Cubical Contents of Buildings at Cologne*, but the same arrangements for exit obtain as at Vienna and Munich. The backs of the show windows are of iron. The goods in the windows are fixed in frames in the basement, and raised by elevators into position. The idea is to separate the contents of the show windows from the shop.

The *New Cologne Municipal Theatre*, designed by *Herr Moritz*, who at the same time acted as Contractor, has seating accommodation for 1,805, and is used as an Opera House. It is exceptionally well planned and embraces all modern improvements. In conjunction with the Theatre there is a large Restaurant and Concert Garden, but this is practically detached. At the rear of the Theatre there is a well-equipped Scene Store of considerable dimensions.

Theatre
Fire Calls

The exterior is of considerable architectural pretensions and in excellent taste. The interior is in the modern German (Nouveau Art) style, which, whilst having many features of interest, appears quite out of place for a public building of this description.

The Theatre is particularly well equipped with Telephones, Call Points and the like. The Fire Call points are distributed one on either side of the stage and one on either side of the Auditorium. In the respective Corridors and on each level there are additional call points besides, making 60 in all. The Call Points are also utilised as electrical watchmen's Control Points.

Theatre
Sprinkler

The stage is protected by a Sprinkler system, so arranged that it can be started in sections or as a whole. There is a reserve of water of 50 cubic metres, in tanks at the top of the building.

Theatre
Exits

The Fire Resisting Curtain was operated from two points. The general impression from the fire point of view was that the exits were of more than ordinary excellence.

Water

At *Cologne* the water mains in this city are almost all on a level. There are no "dead heads." The pressure is about 4 atmospheres. Hydrants are about 200 yards apart. The Brigade has six Chemical Engines for the first "turn outs." The line of hose from the chemical engines can be connected up to the hose from the hydrants.

The *Return Journey* from Cologne to London was uneventful. Facilities were accorded the Commission as before.

Messrs. Sachs and Sheppard left the party at 8 p.m. for Antwerp.

The following reached London together: *Messrs. Max Clarke, H. S. Folker, H. F. J. Hallowes, Ellis Marsland, G. H. Pizey, and Ellis H. Prilchett*.

APPENDIX A

THE ANTWERP PETROLEUM FIRE

(August 26th, 1904)

Diary.
Tuesday, Aug. 30th.

Technical Notes.

ANTWERP.

Messrs. Sachs and Sheppard having left the party on the Belgium frontier and travelled to **Antwerp** to visit the scene of the **Petroleum Explosion** at **Hoboken**, devoted the forenoon of August 30th to going over the scene of the fire, which was still well alight in places. They were accorded the necessary facilities at the instance of the *British Consul-General*, and by the courtesy of the *Chief Officer of the Antwerp Fire Brigade*.

Messrs. Sachs and Sheppard were entertained at Luncheon by *Alderman Van Kuyck*.

They afterwards visited the **Entrepôt Royal** warehouses as reconstructed after the great fire of 1901, and also **Messrs. Tietz's Retail Stores**. They left Antwerp in the evening.

The authorities have provided a site at **Hoboken** for the *Petroleum Industry of the Port of Antwerp*, to which they require all large public petroleum stores to be removed.

This *Site* has a total area of about fifty acres. Its level is below high-water mark in the river, where tank steam vessels lie and pump their cargoes of petroleum through pipe lines to the stores. At this point the river is banked, the shipping being at a safe distance from the stores.

The site is surrounded by public roads and tram lines. Numerous private tram lines pass over the site.

At present there are no premises near the site that can be considered to be seriously endangered.

Three distinct stores had been established at the time, viz.,
(1) *American Petroleum Company*, (2) *Eiffe & Co.*, (3) *Riehl & Co.*

The *Hollando Belge Co.* were engaged constructing tanks on part of the site situate between the American and the Eiffe Stores, for which purpose steam boilers with furnaces and open forges were in use at the time of the disaster.

In addition to the foregoing there remains space on the site described for about seven other similar establishments.

It is stated that the tanks destroyed had been removed from other sites and reconstructed here.

The American Company had five large and four smaller tanks. These are surrounded by a brick wall about ten feet high and two feet six inches thick at the base. The whole space within the walls was covered with a bed of concrete upon which the tanks rested.

There was one division wall separating the tanks into two groups, and one tank was surrounded by a wall.

The fourth tank (counting from the Offices of the American Company) in connection with which the fire is said to have originated, is stated to have been filled with Petroleum (about 20,000 barrels) for the first time since its reconstruction in the present position, and that it was quite full immediately before the fire.

All the Petroleum stored is said to have been oil in general use for lamps, etc., abroad, which has a flash point a few degrees below that allowed without restriction in the United Kingdom.

On the morning of the fire the fourth tank of the American Company before referred to is stated in some way, not at present definitely explained, to have started a leak.

It has been suggested by the local authorities that the leak may have resulted from a settlement, but the existing base of the tank shows no clear evidence of this. It is also suggested by private parties that caulking of the plates was in progress to stop small leaks, and that during this process several rivets were started. It is also suggested that painting was in progress from a boat hung from the top of this tank, and the hook from which the boat was supposed to have been hung was shown.

Petroleum Explosion

Petroleum Store Site

The Stores affected

Arrangement of Tanks

Tank causing Catastrophe

Nature of Petroleum

Cause

Technical Notes (continued).

It may be pointed out that explosions have been known to occur during the filling of tanks with high flash oil, possibly caused by electric sparks (produced by friction as the oil passes the ends of pipes) exploding oil vapour and air contained in the part of the tank not filled with oil.

It was apparent that a violent explosion had occurred in the large tank, having a capacity of about 20,000 barrels, as it was completely torn away round the lowest line of rivets and forced through or over the enclosing wall for a distance of about 20 feet. Explosion

A smaller tank near having a capacity of about 5,000 barrels was moved bodily for about 10 feet, throwing down the enclosing wall on the opposite side, a large hole at the same time being made in the side of this tank. Other tanks of the American Co. were also injured and large portions of the enclosing walls destroyed, masses of brickwork about 8 feet by 3 feet and 2 feet 6 inches thick being thrown from 10 to 15 feet. Results

The brick enclosing walls had been built on a smooth bed of concrete which gave no key, so that they were displaced down to the level of the floor surrounding the tanks.

The walls built round the tanks have thus not resisted the force of the explosion.

The enclosing walls to the Eiffel tanks are of concrete with buttresses probably reinforced with steel rods. These are still standing, but would also not resist the full force of a similar explosion.

Holes of 18 inches diameter had been left at the bottom of these walls in several places, in sets of three, but the flood of oil did not apparently reach any of these holes.

The large quantity of Petroleum liberated by the destruction of tanks and their enclosing walls spread in sheets of flame over the surrounding ground for a space of at least 10 acres, involving the whole of the American Co.'s installation, also the works and three of the tanks of the Eiffel Co., about 300 feet distant.

The whole area over which the burning Petroleum spread has been subjected to great heat, steel tram rails have been twisted, wood sleepers consumed and granite paving sets calcined.

This disaster, causing the death of at least eight persons, repeats previous experiences with similar tanks containing high-flash mineral oil, giving further proof of the existence of explosive conditions over the oil in the unfilled portions of tanks, where the surface of oil gives off vapour to form an explosive atmosphere. Deaths

Unless, in addition to guarding against outflow of oil, the dangerous explosive atmosphere referred to can be avoided, all large mineral oil store tanks should be removed to a distance from dwellings and other buildings. Precautions

THE ANTWERP ENTREPÔT ROYAL.

The new warehouses of the *Entrepôt Royal* for the storage of merchandise, built on the site of warehouses destroyed by fire, June 5, 1901, have many interesting features. Ware-houses

Each storey is divided into compartments of moderate capacity by walls and floors of fire-resisting construction; the access to these compartments on each level being from enclosed outside staircases and open balconies. The roof is flat, partly of timber and felt covered with six inches of gravel. The windows have iron frames bolted to the walls, glazed with wired glass. All door openings from the compartments to the balconies are fitted with steel revolving shutters.

The idea upon which the foregoing arrangements are based, if perfectly carried through, would be excellent, and with provision for the early discovery of an outbreak of fire, and the prompt attendance of a well-organised fire service with suitable extinguishing appliances, a serious spread of fire should be prevented.

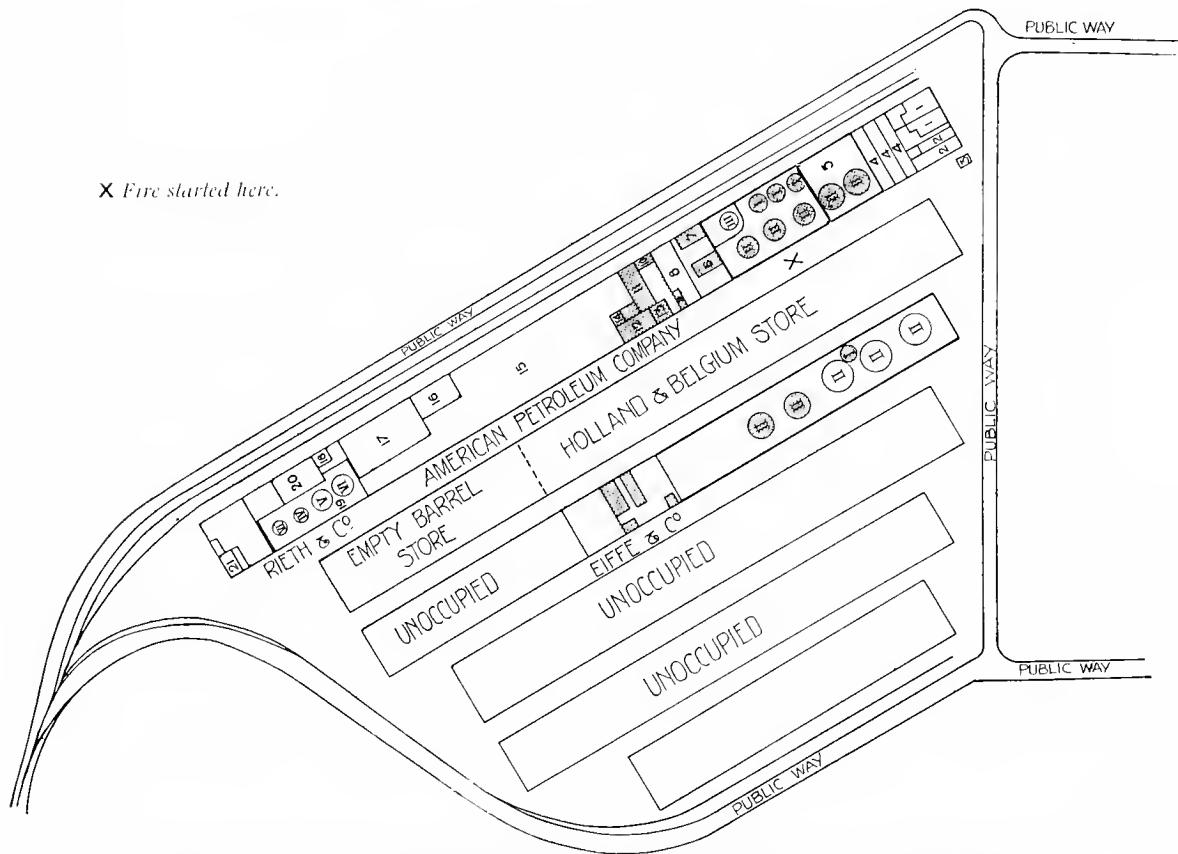
The ultimate value of all fire-resisting buildings is, however, only that of their weakest part; it may, therefore, be instructive to remark some weak points that were observed.

The floors, beams, columns, enclosures to staircases and the balconies are of reinforced concrete. From the scantling and form of some of these members, it is to be feared that the thickness of concrete in front of the metal reinforcing rods is not sufficient to prevent continued heat seriously weakening their tensile resistance. The nature of the material used for the concrete was not ascertained. Lifts pass through all floors of several of the compartments enclosed with thin incombustible partitions, which have lofty door openings provided with light iron doors of poor construction which did not close properly. In addition, openings about nine inches diameter occurring in the concrete floors had been left. For what purpose these openings were formed is not apparent. They would allow of the rapid spread of fire, and lead to much damage by water.

The sub-division of the vaults, in which tallow and vegetable oils are stored, is stated to follow that of the compartments over, but openings are believed to exist in some of these division walls.

The use of compartments for goods of a similar character only is not observed, and very little attention appears to be given to a classification of the goods stored.

One old block which had not been destroyed in the fire of 1901 has not yet been rebuilt.



Figs. 42 and 43.—THE ANTWERP PETROLEUM FIRE. GENERAL PLAN OF PETROLEUM STORES AND A VIEW TAKEN DURING THE FIRE.

APPENDIX B

GENERAL ARRANGEMENTS

OF THE

SPECIAL COMMISSION

OBJECT OF THE COMMISSION.

The Special Commission was formed of Executive Officers of the British Fire Prevention Committee and of the National Fire Brigades' Union to attend the International Fire Service Congress at Budapesth, and to obtain information regarding the Fire Preventive measures and Fire Service arrangements of the following cities, namely, Vienna, Budapesth, Munich, Nuremberg, Frankfort, and Cologne, having special regard to the questions of the Safety of Theatres, Safety of Warehouses and other Tall Buildings and the Life-saving and general Equipment of the local Fire Brigades.

The Commission is representative jointly of the British Fire Prevention Committee and the National Fire Brigades' Union at the Congress.

THE COMMISSION'S
GENERAL ARRANGEMENTS.

Prior to setting out upon the journey the following memoranda were issued as embodying the general arrangements with which the Members of the Commission were expected to conform :—

Members of the Commission are *expected to conform with its general arrangements* and to assist in compiling the notes taken as to specific branches of fire service and structural matters examined on the journey.

The arrangements for the journey are such as to allow the party to travel outwards to Budapesth, to stay in Budapesth and to return together.

NOTES ON THE GENERAL ARRANGEMENTS.

The Members of the Commission found the *General Arrangements* to be convenient.

The Members fell in with the frequently somewhat onerous requirements so that the journey passed off without any hitches and was eminently an harmonious one, besides being instructive and pleasurable.

The *Punctuality* of the Members was remarkable.

The work of *Taking Notes* was distributed among the Members of the Commission by Sections, each Member taking up a special department, preferably one in which he was particularly interested.

The party will assemble Saturday, August 13th (9.20 at Charing Cross, London, in order to start at 10 a.m.), and return Tuesday, 30th, early.

Note:—Those who desire to return earlier can leave the party at Budapest on Monday, August 22nd.

The approximate itinerary is for 16 days, of which actual travelling distance each way is about 48 hours, *i.e.*, together 96 hours = 4 full days and nights.

The financial arrangements are to be in form of a pool for all expenses of the return railway and boat fares, from London and back to London, and for the hotel accommodation, three meals (exclusive of drinks), joint carriages, etc., from London 10 a.m. Saturday to London Tuesday 30th, 6 a.m.

It is intended to travel first class throughout, and use the "train-de-luxe" sleepers and dining-cars, and put up at first-class hotels.

Cost.—It has been estimated that the journey will cost each member £35 (exclusive of drinks, private entertainments, etc.). The £35 is to be paid into the common pool in advance. In the event of there being a surplus it will be returned by October 15th, or if there is a deficit it must be paid to the treasurers by October 15th. *Members leaving at Budapest receive a rebate of £5.*

Applications to join must be accompanied by a cheque for £15 (of which £2 is forfeited for railway forfeit and general expenses if not travelling), the balance

The party travelled outwards together, *Mr. Collins* joining *en route*. *Lieut.-Col. Fox* remained at Budapest. *Mr. Collins* left the party at Vienna on the homeward journey, but rejoined at Frankfort for half a day.

A *Detailed Itinerary* was issued. Whenever a change of programme became necessary the particulars were given out directly after breakfast.

The health of the party throughout was excellent, but such Commissions should in future always be accompanied by a medical officer.

The arrangement of a *General Pool* was found to be economical. Ordinary liquid refreshment was, however, provided at meals as the separate handling of accounts for drinks was found to be inconvenient. Several members, naturally, did not participate in all meals, etc., but it should be clearly understood on future occasions that absence from meals does not entitle to any refund.

The *Estimate* fully covered the specified items. Including liquid refreshment at meals, general entertainments, etc., the *Expenditure* per head, after allowing for the preliminary printing, etc., was £35 13s. 4d.

In two instances there was a rebate of £5 for members leaving the party *en route*, and one refund for £3 for meals not partaken of.

The total expenditure was thus:—

	£ s. d.
9 + 1 members at £35...	350 0 0
Less 2 rebates at £5 ...	£10
Less 1 refund at £3 ...	3
	—
	13 0 0
	£337 0 0
Add 9 + 1 members at 13s. 4d.	6 13 4
Total Expenditure...	<u>£343 13 4</u>

should be paid by July 11th (of which £3 is forfeited, if not actually travelling, this being notified by August 1st, and £5 is forfeited if non-travelling is notified later).

Hon. Secs. and Treasurers.—The joint hon. secs. and treasurers will be Mr. Ellis Marsland and Mr. Horace Folker, F.A.I., and a balance sheet will be issued.

Luggage.—Members of the party are requested to limit baggage to 3 pieces as follows :

1 trunk (56 lbs. free)* Registered.
 1 bag (small Gladstone
 permissible).
 1 hat box (or helmet
 case).
 } Hand baggage.
Gum, stick and light rug strapped to bag, overcoat loose.
 * Extra weight costs about 15s. per 20 lbs.

Special distinguishing luggage label-strips and stick on labels will be issued and *must* be attached to *all* baggage in duplicate (strips top and bottom crossways); also tie-on labels (one to each packet) will be issued and must be attached and changed from time to time.

Chief Officer Pizey kindly acts as Hon. Baggage Master.

Officer of the Day.—One member (in rotation as far as practicable) will daily act as officer-of-the-day with the particular duty to see to punctuality; receive callers, etc., where required; see to room distribution; and see to the comfort of the deputation.

When on duty, the member in question will make a point of being available for emergencies throughout the day, and if not available, to arrange for a deputy to take his duty temporarily.

		<i>Details of Expenditure.</i>	£	s.	d.
Baggage	...	11	4	1	
Hotels	...	133	6	6	
Special Gratuities	...	7	17	0	
Carriages	...	4	12	0	
Railway and Boats	...	158	4	4	
Telegrams	...	2	1	0	
Museums, Theatres, etc.	...	3	0	6	
Interpreters, Translations, etc.	...	5	4	0	
Photographs and Guide-books	...	2	4	5	
Incidentals	...	5	15	1	
		<hr/>	£333	8	11
Add : N.F.B.U. Postage, etc. a/c.			1	7	11
B.F.P.C. Printing	...	8	16	6	
		<hr/>	343	13	4

The average *Luggage Allowance* of 56 lbs. was not found to be sufficient for this journey owing to several members of the party having to take full dress uniform and high boots.

The system of *Luggage Labels* and broad red strips affixed to all luggage was found most serviceable. Not a single piece of luggage was lost or delayed, the pieces of baggage were easily recognisable by the party as well as by railway officials and hotel employés.

The *Hon. Baggage Master's* duties were at times very onerous, particularly on arrival at Budapesth, where some 100 delegates arrived by one train for the same hotel, but the duties were most successfully performed.

The arrangement of *Officers of the Day* was most practical, and facilitated the Commission's journey, greatly adding to the comfort of the members. The duty was occasionally onerous, commencing at 5.30 a.m. and ending at midnight, but it relieved the remainder of the Commission on the day in question of all minor trouble. The duty was taken, as far as possible, in turn as follows :

Aug. 13th— <i>Sachs</i>	Aug. 22nd— <i>Sheppard</i>
“ 14th— <i>Folker</i>	“ 23rd— <i>Sachs</i>
“ 15th— <i>Marsland</i>	“ 24th— <i>Folker</i>
“ 16th— <i>Clarke</i>	“ 25th— <i>Marsland</i>
“ 17th— <i>Collins</i>	“ 26th— <i>Clarke</i>
“ 18th— <i>Pritchett</i>	“ 27th— <i>Hallows</i>
“ 19th— <i>Hallows</i>	“ 28th— <i>Pizey</i>
“ 20th— <i>Pizey</i>	“ 29th— <i>Pritchett</i>
“ 21st— <i>Pritchett</i>	

Dress.—N.F.B.U. officers will travel in *undress uniform* (reefer or Norfolk), black boots or shoes, and caps (with white covers), tan gloves. [U.D.]

N.F.B.U. officers will carry full dress kit (in trunk) and helmets; top-boots. [F.D.]

B.F.P.C. members travel in blue reefer testing suits, black boots or shoes, and testing peak caps, tan gloves. [U.D.]

B.F.P.C. will carry with them evening dress kits, [Evn.D.] frock coat kits [Frk.D.] (in trunk) and top hats.

Light jacket suit and soft hat should be taken by all, also at least one pair of white ducks. [Flns.]

The *Undress Uniform* of the N.F.B.U. and blue reefer testing suits of the B.F.P.C. were found most convenient for travel. N.F.B.U. officers would find it more convenient to have interchangeable buttons and no badges on undress kit when travelling abroad, so that they can transform into mufti where undress uniform is not wanted, thereby saving carriage of a spare mufti jacket suit. The white cap covers were found most convenient in the great heat encountered, and also for recognising members of the party from afar. The N.F.B.U. undress kit (both reefer and jumper) is no doubt the most serviceable, and at the same time neatest, undress uniform in the fire service.

Detailed packing suggestions were issued. The importance of having several spare pairs of ducks for summer travel should be remembered.

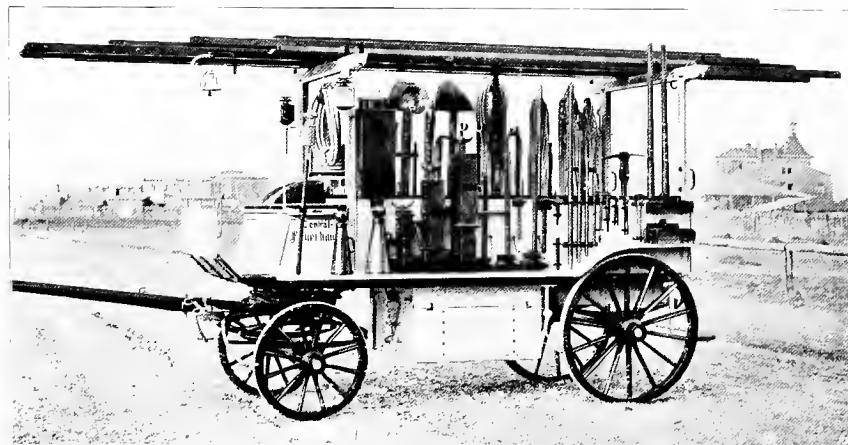


Fig. 44.—MUNICH PROFESSIONAL FIRE BRIGADE. DANGEROUS STRUCTURE FIRST AID TRAP.

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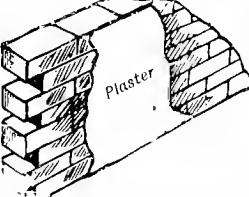
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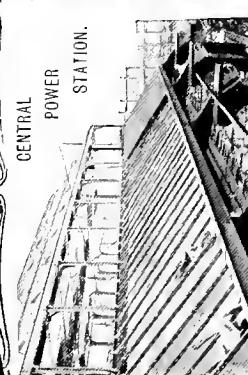
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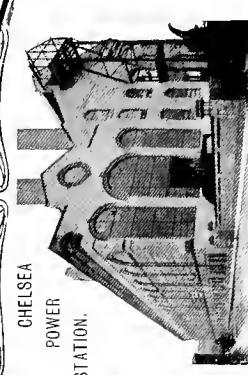
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